

10/584367

AP20 Rec'd PCT/PTO 23 JUN 2006

SEQUENCE LISTING

<110> Imperial College Innovations Limited
<120> Vaccines

<130> ICOBW/P32315PC

<141> 22/12/04

<150> 0330007.6

<151> 23/12/03

<160> 56

<170> SeqWin99

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<211> 2628

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0341 (TspA) DNA sequence

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 <213> Neisseria meningitidis serogroup B NMB0341 (TspA) protein sequence

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Tyr Ile Leu Lys Asn Asn Arg Gln Ile Lys Leu Ile Ala Ala Ser Val			
35	40	45	
Ala Val Ala Ala Ser Phe Gln Ala His Ala Gly Leu Gly Gly Leu Asn			
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Ile Gln Ser Asn Leu Asp Glu Pro Phe Ser Gly Ser Ile Thr Val Thr			
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Gly Glu Glu Ala Lys Ala Leu Leu Gly Gly Ser Val Thr Val Ser			
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Glu Lys Gly Leu Thr Ala Lys Val His Lys Leu Gly Asp Lys Ala Val			
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Ile Ala Val Ser Ser Glu Gln Ala Val Arg Asp Pro Val Leu Val Phe			
115	120	125	
Arg Ile Gly Ala Gly Ala Gln Val Arg Glu Tyr Thr Ala Ile Leu Asp			
130	135	140	
Pro Val Gly Tyr Ser Pro Lys Thr Lys Ser Ala Leu Ser Asp Gly Lys			
145	150	155	160
Thr His Arg Lys Thr Ala Pro Thr Ala Glu Ser Gln Glu Asn Gln Asn			
165	170	175	
Ala Lys Ala Leu Arg Lys Thr Asp Lys Lys Asp Ser Ala Asn Ala Ala			
180	185	190	
Val Lys Pro Ala Tyr Asn Gly Lys Thr His Thr Val Arg Lys Gly Glu			
195	200	205	
Thr Val Lys Gln Ile Ala Ala Ile Arg Pro Lys His Leu Thr Leu			
210	215	220	
Glu Gln Val Ala Asp Ala Leu Leu Lys Ala Asn Pro Asn Val Ser Ala			
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His Gly Arg Leu Arg Ala Gly Ser Val Leu His Ile Pro Asn Leu Asn			
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Arg Ile Lys Ala Glu Gln Pro Lys Pro Gln Thr Ala Lys Pro Lys Ala
260 265 270

Glu Thr Ala Ser Met Pro Ser Glu Pro Ser Lys Gln Ala Thr Val Glu
275 280 285

Lys Pro Val Glu Lys Pro Glu Ala Lys Val Ala Ala Pro Glu Ala Lys
290 295 300

Ala Glu Lys Pro Ala Val Arg Pro Glu Pro Val Pro Ala Ala Asn Thr
305 310 315 320

Ala Ala Ser Glu Thr Ala Ala Glu Ser Ala Pro Gln Glu Ala Ala Ala
325 330 335

Ser Ala Ile Asp Thr Pro Thr Asp Glu Thr Gly Asn Ala Val Ser Glu
340 345 350

Pro Val Glu Gln Val Ser Ala Glu Glu Glu Thr Glu Ser Gly Leu Phe
355 360 365

Asp Gly Leu Phe Gly Gly Ser Tyr Thr Leu Leu Leu Ala Gly Gly Gly
370 375 380

Ala Ala Leu Ile Ala Leu Leu Leu Leu Arg Leu Ala Gln Ser Lys
385 390 395 400

Arg Ala Arg Arg Thr Glu Glu Ser Val Pro Glu Glu Glu Pro Asp Leu
405 410 415

Asp Asp Ala Ala Asp Asp Gly Ile Glu Ile Thr Phe Ala Glu Val Glu
420 425 430

Thr Pro Ala Thr Pro Glu Pro Ala Pro Lys Asn Asp Val Asn Asp Thr
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Leu Ala Leu Asp Gly Glu Ser Glu Glu Glu Leu Ser Ala Lys Gln Thr
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Phe Asp Val Glu Thr Asp Thr Pro Ser Asn Arg Ile Asp Leu Asp Phe
465 470 475 480

Asp Ser Leu Ala Ala Ala Gln Asn Gly Ile Leu Ser Gly Ala Leu Thr
485 490 495

Gln Asp Glu Glu Thr Gln Lys Arg Ala Asp Ala Asp Trp Asn Ala Ile
500 505 510

Glu Ser Thr Asp Ser Val Tyr Glu Pro Glu Thr Phe Asn Pro Tyr Asn
515 520 525

Pro Val Glu Ile Val Ile Asp Thr Pro Glu Pro Glu Ser Val Ala Gln
530 535 540

Thr Ala Glu Asn Lys Pro Glu Thr Val Asp Thr Asp Phe Ser Asp Asn
545 550 555 560

Leu Pro Ser Asn Asn His Ile Gly Thr Glu Glu Thr Ala Ser Ala Lys
565 570 575

Pro Ala Ser Pro Ser Gly Leu Ala Gly Phe Leu Lys Ala Ser Ser Pro

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Thr		
Ile		
Leu		
Glu		
Lys		
Thr		
Val		
Ala		
Glu		
Val		
Gln		
Thr		
Pro		
Glu		
Glu		
595	600	605
Leu		
His		
Asp		
Phe		
Leu		
Lys		
Val		
Tyr		
Glu		
Thr		
Asp		
Ala		
Val		
Ala		
Glu		
610	615	620
Ala		
Pro		
Glu		
Thr		
Pro		
Asp		
Phe		
Asn		
Ala		
Ala		
Asp		
Asp		
Leu		
Ser		
Ala		
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Gln		
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Glu		
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Pro		
Ser		
Val		
Glu		
Asn		
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Thr		
Glu		
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Thr		
Val		
Ala		
Glu		
Thr		
Pro		
Asp		
Phe		
Asn		
Ala		
Thr		
Ala		
Asp		
Asp		
Leu		
Ser		
Ala		
Leu		
Gln		
660	665	670
Ala		
Leu		
Gln		
Pro		
Ser		
Lys		
Val		
Pro		
Ala		
Val		
Glu		
Asn		
Ile		
Thr		
Glu		
675	680	685
Glu		
Thr		
Val		
Ala		
Asp		
Asp		
Leu		
Ser		
Ala		
Leu		
Gln		
690	695	700
Pro		
Ala		
Val		
Glu		
Asn		
705	710	715
Phe		
Asn		
Ala		
Thr		
Ala		
Asp		
Asp		
Leu		
Ser		
Ala		
Leu		
Gln		
725	730	735
Ala		
Pro		
Ala		
Val		
Glu		
Asn		
Ala		
Glu		
Thr		
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Ala		
Asp		
Asp		
Leu		
740	745	750
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Leu		
Gln		
755	760	765
Ala		
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Ile		
Thr		
Leu		
Glu		
770	775	780
Pro		
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Asp		
Phe		
Leu		
Lys		
Asp		
Gly		
Glu		
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Ile		
Tyr		
Leu		
Ser		
Glu		
Glu		
Asn		
Ile		
Pro		
Asn		
Asn		
Ala		
Asp		
Thr		
Ser		
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Phe		
Pro		
Ser		
Glu		
Ser		
Val		
Gly		
Ser		
Asp		
Ala		
Pro		
Ser		
Glu		
Ala		
Lys		
Tyr		
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Ala		
Glu		
Met		
Tyr		
Leu		
Glu		
Ile		
Gly		
Asp		
Arg		
Asp		
Ala		
Ala		
Gln		
835	840	845
Glu		
Thr		
Val		
Gln		
Lys		
Leu		
Leu		
Glu		
Glu		
Ala		
Gly		
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Val		
Leu		
Lys		
850	855	860
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 <213> Neisseria meningitidis serogroup B NMB0338 DNA sequence

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ttgtcggtac gtggcagaa cggcagggtt cgtgccgaag taaagaaaaa tgccgtttg 360
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<213> Neisseria meningitidis serogroup B NMB0338 protein sequence

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35 40 45

Gly Val Phe Ile Tyr Gly Ala Asn Met Lys Leu Ile Tyr Thr Val Ile
50 55 60

Lys Ile Ile Ile Leu Leu Phe Leu Leu Leu Ala Val Ile Asn Thr
65 70 75 80

Asp Ala Val Thr Phe Ser Tyr Leu Pro Gly Gln Lys Phe Asp Leu Pro
85 90 95

Leu Ile Val Val Leu Phe Gly Ala Phe Val Val Gly Ile Ile Phe Gly
100 105 110

Met Phe Ala Leu Phe Gly Arg Leu Leu Ser Leu Arg Gly Glu Asn Gly
115 120 125

Arg Leu Arg Ala Glu Val Lys Lys Asn Ala Arg Leu Thr Gly Lys Glu
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420

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<212> PRT

<213> Neisseria meningitidis serogroup B NMB1345 protein sequence

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Gln	Gln	Gln	Ile	Leu	Gln	Glu	Thr	Gly	Phe	Leu	Thr	Val	Glu	Ser	
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His	Gln	Tyr	Glu	Arg	Gly	Trp	Phe	Thr	Ser	Met	Glu	Thr	Thr	Val	Ile
						50			55			60			

Arg	Leu	Lys	Pro	Glu	Leu	Leu	Asn	Asn	Ala	Arg	Lys	Tyr	Leu	Pro	Asp
						65				75			80		

Asn	Leu	Lys	Thr	Val	Leu	Glu	Gln	Pro	Val	Thr	Leu	Val	Asn	His	Ile
						85			90			95			

Thr	His	Gly	Pro	Phe	Ala	Gly	Gly	Phe	Gly	Thr	Gln	Ala	Tyr	Ile	Glu
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Thr	Glu	Phe	Lys	Tyr	Ala	Pro	Glu	Thr	Glu	Lys	Val	Leu	Glu	Arg	Phe
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Phe	Gly	Lys	Gln	Val	Pro	Ala	Ser	Leu	Ala	Asn	Thr	Val	Tyr	Phe	Asn
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Gly	Ser	Gly	Lys	Met	Glu	Val	Ser	Val	Pro	Ala	Phe	Asp	Tyr	Glu	Glu
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Leu	Ser	Gly	Ile	Arg	Leu	His	Trp	Glu	Gly	Leu	Thr	Gly	Glu	Thr	Val
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Tyr	Gln	Lys	Gly	Phe	Lys	Ser	Tyr	Arg	Asn	Gly	Tyr	Asp	Ala	Pro	Leu
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Phe Lys Ile Lys Leu Ala Asp Lys Gly Asp Ala Ala Phe Glu Lys Val
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His Phe Asp Ser Glu Thr Ser Asp Gly Ile Asn Pro Leu Ala Leu Gly
210 215 220

Ser Ser Asn Leu Thr Leu Glu Lys Phe Ser Leu Glu Trp Lys Glu Gly
225 230 235 240

Val Asp Tyr Asn Val Lys Leu Asn Glu Leu Val Asn Leu Val Thr Asp
245 250 255

Leu Gln Ile Gly Ala Phe Ile Asn Pro Asn Gly Ser Ile Ala Pro Ser
260 265 270

Lys Ile Glu Val Gly Lys Leu Ala Phe Ser Thr Lys Thr Gly Glu Ser
275 280 285

Gly Ala Phe Ile Asn Ser Glu Gly Gln Phe Arg Phe Asp Thr Leu Val
290 295 300

Tyr Gly Asp Glu Lys Tyr Gly Pro Leu Asp Ile His Ile Ala Ala Glu
305 310 315 320

His Leu Asp Ala Ser Ala Leu Thr Val Leu Lys Arg Lys Phe Ala Gln
325 330 335

Ile Ser Ala Lys Lys Met Thr Glu Glu Gln Ile Arg Asn Asp Leu Ile
340 345 350

Ala Ala Val Lys Gly Glu Ala Ser Gly Leu Phe Thr Asn Asn Pro Val
355 360 365

Leu Asp Ile Lys Thr Phe Arg Phe Thr Leu Pro Ser Gly Lys Ile Asp
370 375 380

Val Gly Gly Lys Ile Met Phe Lys Asp Met Lys Lys Glu Asp Leu Asn
385 390 395 400

Gln Leu Gly Leu Met Leu Lys Lys Thr Glu Ala Asp Ile Arg Met Ser
405 410 415

Ile Pro Gln Lys Met Leu Glu Asp Leu Ala Val Ser Gln Ala Gly Asn
420 425 430

Ile Phe Ser Val Asn Ala Glu Asp Glu Ala Glu Gly Arg Ala Ser Leu
435 440 445

Asp Asp Ile Asn Glu Thr Leu Arg Leu Met Val Asp Ser Thr Val Gln
450 455 460

Ser Met Ala Arg Glu Lys Tyr Leu Thr Leu Asn Gly Asp Gln Ile Asp
465 470 475 480

Thr Ala Ile Ser Leu Lys Asn Asn Gln Leu Lys Leu Asn Gly Lys Thr
485 490 495

Leu Gln Asn Glu Pro Glu Pro Asp Phe Asp Glu Gly Gly Met Val Ser
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Glu Pro Gln Gln
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<211> 855
<212> DNA
<213> Neisseria meningitidis serogroup B NMB0738 DNA sequence

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gtgtcgatc atatcgAACG tgccggacgaa accgaattgg cggtcagcgt cgatgtgcgt 180
tcggcattt acatcgAACG gcgcgggaa cagattgcct ctctgcgcag actggggcac 240
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gttaccgtcg ccattcggtt cacgggagga cagcaccgtt cggcttatat tgcgaaaaaa 780
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<213> Neisseria meningitidis serogroup B NMB0738 protein sequence

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Pro Leu Glu Met Leu Pro Ala Leu Val Ser Tyr His Ile Glu Arg Ala
35 40 45

Asp Glu Thr Glu Leu Ala Val Ser Val Asp Val Arg Ser Gly Ile Asp
50 55 60

Ile Gly Gln Ala Arg Glu Gln Ile Ala Ser Leu Arg Arg Leu Gly His
65 70 75 80

Arg Val Glu Val Leu Phe Val Glu Ala Glu Glu Ser Val Leu Val Arg
85 90 95

Arg Phe Ser Glu Thr Arg Arg Gly His Pro Leu Ser Asn Gln Asp Met
100 105 110

Thr Leu Leu Glu Ser Leu Lys Lys Glu Arg Glu Trp Leu Phe Pro Leu
115 120 125

Lys Glu Ile Ala Tyr Cys Ile Asp Thr Ser Lys Met Asn Ala Gln Gln
130 135 140

Leu Arg His Ala Val Arg Gln Trp Leu Lys Val Glu Arg Thr Gly Leu
145 150 155 160

Leu Val Ile Leu Glu Ser Phe Gly Phe Lys Tyr Gly Val Pro Asn Asn
 165 170 175
 Ala Asp Phe Met Phe Asp Met Arg Ser Leu Pro Asn Pro Tyr Tyr Asp
 180 185 190
 Pro Glu Leu Arg Pro Tyr Thr Gly Met Asp Lys Pro Val Trp Asp Tyr
 195 200 205
 Leu Asp Gly Gln Pro Leu Val Gln Glu Met Val Asp Asp Ile Glu Arg
 210 215 220
 Phe Val Thr His Trp Leu Pro Arg Leu Glu Asp Glu Ser Arg Ser Tyr
 225 230 235 240
 Val Thr Val Ala Ile Gly Cys Thr Gly Gly Gln His Arg Ser Val Tyr
 245 250 255
 Ile Val Glu Lys Leu Ala Arg Arg Leu Lys Gly Arg Tyr Glu Leu Leu
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 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0792 DNA sequence

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 gtgccgattt tcggcgtcgt actcgggttc cccgacatgg acataaaaaa ggcgatggct 300
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 atgaaagtgg cggttttagt gttttccctc gttaccgcct ttctgtccat gtggatcage 480
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 cagaaaaaaag aacacaaaac ctacgtcttc ctcctgtcg gcatcgccata ttgcgcgcagc 600
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 aatctggact tcgtcggctg gatgaagctc ggcctgccc tgatgctgtt gattctgccc 720
 ttgatgctgc tctccctgtt cgtcatccctc aaacctaatt tgaacgaacg cgtggaaatc 780
 aaagccgaat ccattccctt gacgctgcac cgcgtatcg cgctgtgtat ttcccttgcc 840
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<210> 10
 <211> 471
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0792 protein sequence
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20 25 30

Thr Ile Ile Ser Ala Val Val Cys Phe Gly Ile Tyr His Ile Leu Pro
35 40 45

Tyr Ser Pro Asp Ala Asn Lys Gly Ile Ala Leu Leu Ile Phe Val Ala
50 55 60

Ala Leu Trp Phe Thr Glu Ala Val His Ile Thr Val Thr Ala Leu Met
65 70 75 80

Val Pro Ile Leu Ala Val Val Leu Gly Phe Pro Asp Met Asp Ile Lys
85 90 95

Lys Ala Met Ala Asp Phe Ser Asn Pro Ile Ile Tyr Ile Phe Phe Gly
100 105 110

Gly Phe Ala Leu Ala Thr Ala Leu His Met Gln Arg Leu Asp Arg Lys
115 120 125

Ile Ala Val Ser Leu Leu Arg Leu Ser Arg Gly Asn Met Lys Val Ala
130 135 140

Val Leu Met Leu Phe Leu Val Thr Ala Phe Leu Ser Met Trp Ile Ser
145 150 155 160

Asn Thr Ala Thr Ala Ala Met Met Leu Pro Leu Ala Met Gly Met Leu
165 170 175

Ser His Leu Asp Gln Glu Lys Glu His Lys Thr Tyr Val Phe Leu Leu
180 185 190

Leu Gly Ile Ala Tyr Cys Ala Ser Ile Gly Gly Leu Gly Thr Leu Val
195 200 205

Gly Ser Pro Pro Asn Leu Ile Ala Ala Lys Ala Leu Asn Leu Asp Phe
210 215 220

Val Gly Trp Met Lys Leu Gly Leu Pro Met Met Leu Leu Ile Leu Pro
225 230 235 240

Leu Met Leu Leu Ser Leu Tyr Val Ile Leu Lys Pro Asn Leu Asn Glu
245 250 255

Arg Val Glu Ile Lys Ala Glu Ser Ile Pro Trp Thr Leu His Arg Val
260 265 270

Ile Ala Leu Leu Ile Phe Leu Ala Thr Ala Ala Ala Trp Ile Phe Ser
275 280 285

Ser Lys Ile Lys Thr Ala Phe Gly Ile Ser Asn Pro Asp Thr Val Ile
290 295 300

Ala Leu Ser Ala Ala Val Ala Val Val Phe Gly Val Ala Gln Trp
305 310 315 320

Lys Glu Val Ala Arg Asn Thr Asp Trp Gly Val Leu Met Leu Phe Gly

325

330

335

Gly Gly Ile Ser Leu Ser Thr Leu Leu Lys Thr Ser Gly Ala Ser Glu
 340 345 350

Ala Leu Gly Gln Gln Val Ala Ala Thr Phe Ser Gly Ala Pro Ala Phe
 355 360 365

Leu Val Ile Leu Ile Val Ala Ala Phe Ile Ile Phe Leu Thr Glu Phe
 370 375 380

Thr Ser Asn Thr Ala Ser Ala Ala Leu Leu Val Pro Ile Phe Ser Gly
 385 390 395 400

Ile Ala Met Gln Met Gly Leu Pro Glu Gln Val Leu Val Phe Val Ile
 405 410 415

Gly Ile Gly Ala Ser Cys Ala Phe Met Leu Pro Val Ala Thr Pro Pro
 420 425 430

Asn Ala Ile Val Phe Gly Thr Gly Leu Ile Lys Gln Arg Glu Met Met
 435 440 445

Asn Val Gly Ile Leu Leu Asn Ile Leu Cys Val Val Leu Val Ala Leu
 450 455 460

Trp Ala Tyr Ala Val Leu Met
 465 470

<210> 11
<211> 1005

<212> DNA
<213> Neisseria meningitidis serogroup B NMB0279 DNA sequence

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gacggcagca gtgtcgtctg catggatgca ccggccgaca agatgaatgtt cgccaccttat 180
ttgaaagtgc agaaactgtt tgacatggtc aatgtgccgc agttatgtca cgccggacacg 240
gatctgggtt ttgttgttattt gaacgacttg ggcaatacga cgtttttgac cgcaatgctt 300
caggaacagg gcgaaacggc gcacaaagcc ctgtttttgg aggcaatcgg cgagttggc 360
gaattgcaga aggcgagccg tgaaggggtt ttgcccgaat atgaccgtga aacgtatgtt 420
cgcgaaatca acctgttccc ggaatggttt gtcgcaaaag aattggggcg cgaattaaca 480
ttcaaacaac gccaactttg gcagcaaaacc gtgcatacgc tgctgcccgc cctgttggcg 540
cagccaaag tctatgtca ccgcgacttt atcgccgca acctgtatgtc gacgcgcggc 600
aggccggccg ttttagactt ccaagacgcg ctttacggcc cgatttctta cgatttgggt 660
tcgctgttgc gcgatgcctt tatcgaatgg gaagaagaat ttgtcttggaa cttggtttac 720
cgctactggg aaaaggcgcc ggctgcccgc ttgcccgtcc ccgaagcggt tgacgagttt 780
taccgcttgt tcgaatggat gggcgtgcag cggcacttga aggttgcagg catcttcgca 840
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tatctgcgcc gctatgcgc ccgttatgcc gaactcgccc cgctctacgc gctcttggc 960
gaactggcgc gcgatgaaga actggaaacg ggcttacgt tttaa 1005

<210> 12
<211> 334
<212> PRT
<213> Neisseria meningitidis serogroup B NMB0279 protein sequence

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Glu Arg Asp Phe Asp Leu Thr Phe Ala Ala Ala Asp Ala Asp Phe Arg
 20 25 30
 Arg Tyr Phe Arg Ala Thr Phe Ser Asp Gly Ser Ser Val Val Cys Met
 35 40 45
 Asp Ala Pro Pro Asp Lys Met Ser Val Ala Pro Tyr Leu Lys Val Gln
 50 55 60
 Lys Leu Phe Asp Met Val Asn Val Pro Gln Val Leu His Ala Asp Thr
 65 70 75 80
 Asp Leu Gly Phe Val Val Leu Asn Asp Leu Gly Asn Thr Thr Phe Leu
 85 90 95
 Thr Ala Met Leu Gln Glu Gln Gly Glu Thr Ala His Lys Ala Leu Leu
 100 105 110
 Leu Glu Ala Ile Gly Glu Leu Val Glu Leu Gln Lys Ala Ser Arg Glu
 115 120 125
 Gly Val Leu Pro Glu Tyr Asp Arg Glu Thr Met Leu Arg Glu Ile Asn
 130 135 140
 Leu Phe Pro Glu Trp Phe Val Ala Lys Glu Leu Gly Arg Glu Leu Thr
 145 150 155 160
 Phe Lys Gln Arg Gln Leu Trp Gln Gln Thr Val Asp Thr Leu Leu Pro
 165 170 175
 Pro Leu Leu Ala Gln Pro Lys Val Tyr Val His Arg Asp Phe Ile Val
 180 185 190
 Arg Asn Leu Met Leu Thr Arg Gly Arg Pro Gly Val Leu Asp Phe Gln
 195 200 205
 Asp Ala Leu Tyr Gly Pro Ile Ser Tyr Asp Leu Val Ser Leu Leu Arg
 210 215 220
 Asp Ala Phe Ile Glu Trp Glu Glu Phe Val Leu Asp Leu Val Ile
 225 230 235 240
 Arg Tyr Trp Glu Lys Ala Arg Ala Ala Gly Leu Pro Val Pro Glu Ala
 245 250 255
 Phe Asp Glu Phe Tyr Arg Trp Phe Glu Trp Met Gly Val Gln Arg His
 260 265 270
 Leu Lys Val Ala Gly Ile Phe Ala Arg Leu Tyr Tyr Arg Asp Gly Lys
 275 280 285
 Asp Lys Tyr Arg Pro Glu Ile Pro Arg Phe Leu Asn Tyr Leu Arg Arg
 290 295 300
 Val Ser Arg Arg Tyr Ala Glu Leu Ala Pro Leu Tyr Ala Leu Leu Val
 305 310 315 320
 Glu Leu Val Gly Asp Glu Glu Leu Glu Thr Gly Phe Thr Phe
 325 330

<210> 13
 <211> 1785
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB2050 DNA sequence

<400> 13

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gaaaaggcg	caagatgtga	ttttgtcgaa	caggcacacg	gcaaaaaccgt	gtcggaaattg	180
gcgggttgg	acgggaaata	ccggcatttg	caggacgaaa	attatgtctt	ggcaaccgt	240
tttccgcag	ccgaaaagca	gattgccat	ttcagggaaa	aagaggcgga	gtcggcgccg	300
ctgaagcagt	cgtatatatcga	gttgcagggaa	aaggcacagg	gtttggcggt	tgaaaacgaa	360
cgtttggcaa	cgcagctcg	acaggaacgg	aaggcgttt	ccgaccaata	tgccttggaa	420
cgccaaatcc	gccaaagaat	cgaaaccgat	tttggaaagaaa	gcccggaaac	tgtccgcgac	480
gtgcaaaacg	acctttccga	tgtcggcaac	cggttgcgg	cagccgaaaa	acagattgcc	540
catttcagg	aaaaagagggc	ggaagcgggag	cggttgcgg	agtcgcatac	cgagttgcag	600
gaaaaggcac	agggttggc	ggttggaaaac	gaacgttgg	caacgc当地	cgaacaggaa	660
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aaccgcgagc	agctccatca	gttttgaac	ccgctaaacg	aacgc当地	cggttgcgc	840
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ttgaaacggc	ttcaggggtt	gaacgc当地	ctgcacagcg	aggcaaaaggc	cctgaccacac	960
gcccgtgacc	gtacgcagaa	taagtttcag	ggcaatttggg	gcccggatgt	tctggaaacg	1020
gttttggaaa	attccggcct	tcagaaaggg	cggaaatatg	tggttcaggc	ggcatccgtc	1080
cggaaaagagg	aagacggcgg	cacgc当地	ctccagcccc	acgttttgc当地	caacctgccc	1140
gacaacaagc	agattgtgat	tgattccaag	gtctcgctga	cagcttatgt	gccc当地	1200
caggcggcgg	atgc当地	ggcggcacgc	gaacttgc当地	cacacgttgc	cacgc当地	1260
gcacacatga	aaggcttgc	gctgaaggat	tacaccgatt	tggaaagggt	gaacacatgg	1320
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gcccggctgt	tccaaagagt	tttcgacaaa	cggttgc当地	tggtcggccc	cagtagcctg	1440
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ctcgaaagcg	tcggcaaagg	catcgatcg	gccc当地	gttttgc当地	ggcattcaag	1620
caacttgccg	aaggcgccg	aatctggtc	ggacgc当地	agaaactgcg	tctgttgggc	1680
gtgaaggcag	gcaaaacaact	tcaacgggat	ttggtcgagc	gttccaatga	aacaacggcg	1740
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<210> -14
 <211> 594
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB2050 protein sequence

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 20 25 30

Ala Gly Leu Asn Ala His Leu Ala Glu Lys Ala Ala Arg Cys Asp Phe
 35 40 45

Val Glu Gln Ala His Gly Lys Thr Val Ser Glu Leu Ala Val Leu Asp
 50 55 60

Gly Lys Tyr Arg His Leu Gln Asp Glu Asn Tyr Ala Leu Gly Asn Arg
 65 70 75 80

Phe Ser Ala Ala Glu Lys Gln Ile Ala His Leu Gln Glu Lys Glu Ala
 85 90 95

Glu Ser Ala Arg Leu Lys Gln Ser Tyr Ile Glu Leu Gln Glu Lys Ala
100 105 110

Gln Gly Leu Ala Val Glu Asn Glu Arg Leu Ala Thr Gln Leu Gly Gln
115 120 125

Glu Arg Lys Ala Phe Ala Asp Gln Tyr Ala Leu Glu Arg Gln Ile Arg
130 135 140

Gln Arg Ile Glu Thr Asp Leu Glu Glu Ser Arg Gln Thr Val Arg Asp
145 150 155 160

Val Gln Asn Asp Leu Ser Asp Val Gly Asn Arg Phe Ala Ala Ala Glu
165 170 175

Lys Gln Ile Ala His Leu Gln Glu Lys Glu Ala Glu Ala Glu Arg Leu
180 185 190

Arg Gln Ser His Thr Glu Leu Gln Glu Lys Ala Gln Gly Leu Ala Val
195 200 205

Glu Asn Glu Arg Leu Ala Thr Gln Ile Glu Gln Glu Arg Leu Ala Ser
210 215 220

Glu Glu Lys Leu Ser Leu Leu Gly Glu Ala Arg Lys Ser Leu Ser Asp
225 230 235 240

Gln Phe Gln Asn Leu Ala Asn Thr Ile Leu Glu Glu Lys Ser Arg Arg
245 250 255

Phe Thr Glu Gln Asn Arg Glu Gln Leu His Gln Val Leu Asn Pro Leu
260 265 270

Asn Glu Arg Ile His Gly Phe Gly Glu Leu Val Lys Gln Thr Tyr Asp
275 280 285

Lys Glu Ser Arg Glu Arg Leu Thr Leu Glu Asn Glu Leu Lys Arg Leu
290 295 300

Gln Gly Leu Asn Ala Gln Leu His Ser Glu Ala Lys Ala Leu Thr Asn
305 310 315 320

Ala Leu Thr Gly Thr Gln Asn Lys Val Gln Gly Asn Trp Gly Glu Met
325 330 335

Ile Leu Glu Thr Val Leu Glu Asn Ser Gly Leu Gln Lys Gly Arg Glu
340 345 350

Tyr Val Val Gln Ala Ala Ser Val Arg Lys Glu Glu Asp Gly Gly Thr
355 360 365

Arg Arg Leu Gln Pro Asp Val Leu Val Asn Leu Pro Asp Asn Lys Gln
370 375 380

Ile Val Ile Asp Ser Lys Val Ser Leu Thr Ala Tyr Val Arg Tyr Thr
385 390 395 400

Gln Ala Ala Asp Ala Asp Thr Ala Ala Arg Glu Leu Ala Ala His Val
405 410 415

Ala Ser Ile Arg Ala His Met Lys Gly Leu Ser Leu Lys Asp Tyr Thr

420	425	430
Asp Leu Glu Gly Val Asn Thr	Leu Asp Phe Val Phe Met	Phe Ile Pro
435	440	445
Val Glu Pro Ala Tyr Leu Leu Ala Leu Gln Asn Asp Ala Gly Leu Phe		
450	455	460
Gln Glu Cys Phe Asp Lys Arg Ile Met Leu Val Gly Pro Ser Thr Leu		
465	470	475
Leu Ala Thr Leu Arg Thr Val Ala Asn Ile Trp Arg Asn Glu Gln Gln		
485	490	495
Asn Gln Asn Ala Leu Ala Ile Ala Asp Glu Gly Gly Lys Leu Tyr Asp		
500	505	510
Lys Phe Val Gly Phe Val Gln Thr Leu Glu Ser Val Gly Lys Gly Ile		
515	520	525
Asp Gln Ala Gln Ser Ser Phe Gln Thr Ala Phe Lys Gln Leu Ala Glu		
530	535	540
Gly Arg Gly Asn Leu Val Gly Arg Ala Glu Lys Leu Arg Leu Leu Gly		
545	550	555
Val Lys Ala Gly Lys Gln Leu Gln Arg Asp Leu Val Glu Arg Ser Asn		
565	570	575
Glu Thr Thr Ala Leu Ser Glu Ser Leu Glu Tyr Ala Ala Glu Asp Glu		
580	585	590

Ala Val

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<210> 15
<211> 561
<212>--DNA
<213> Neisseria meningitidis serogroup B NMB1335 DNA sequence

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<400> 15
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gaagtggaaag gattcgacga tcccgacgtt caaggggttg cctgttatat ttctgtatgca 180
aaaaaaaaaggcg gcttgaagga aatggtcaat ttggaagagg acgcgtccga cgcacatcggtt 240
tcgtgcgttc agacggcatc ttgcattttct tttgacgaaa ccgcgcgtgcg caaacccgaaa 300
gaagttttca aacacgggtgc gagcttcgacg ttcaagagcc ggcagattgt ccgttattac 360
gaccccaaac gcaaaaacctt cgcctatttg gtgtacagcg ataaaaatcat ccaaggctcg 420
ccgaaaaatt ccttaagcgc ggtttcctgt ttccggcgccg gcataccgca aaccgatggg 480
gtgcaagccg atacttccgg caacctgctt gcccggcgctt gcatgatttc caacccgata 540
gaaaatctcg acaaacgctg a 561

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<210> 16
<211> 186
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1335 protein sequence

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<400> 16
Met Asn Arg Leu Leu Leu Ser Ala Ala Val Leu Leu Thr Ala Cys
1 5 10 15

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Gly Ser Gly Glu Thr Asp Lys Ile Gly Arg Ala Ser Thr Val Phe Asn
 20 25 30

Ile Leu Gly Lys Asn Asp Arg Ile Glu Val Glu Gly Phe Asp Asp Pro
 35 40 45

Asp Val Gln Gly Val Ala Cys Tyr Ile Ser Tyr Ala Lys Lys Gly Gly
 50 55 60

Leu Lys Glu Met Val Asn Leu Glu Glu Asp Ala Ser Asp Ala Ser Val
 65 70 80

Ser Cys Val Gln Thr Ala Ser Ser Ile Ser Phe Asp Glu Thr Ala Val
 85 90 95

Arg Lys Pro Lys Glu Val Phe Lys His Gly Ala Ser Phe Ala Phe Lys
 100 105 110

Ser Arg Gln Ile Val Arg Tyr Tyr Asp Pro Lys Arg Lys Thr Phe Ala
 115 120 125

Tyr Leu Val Tyr Ser Asp Lys Ile Ile Gln Gly Ser Pro Lys Asn Ser
 130 135 140

Leu Ser Ala Val Ser Cys Phe Gly Gly Ile Pro Gln Thr Asp Gly
 145 150 155 160

Val Gln Ala Asp Thr Ser Gly Asn Leu Leu Ala Gly Ala Cys Met Ile
 165 170 175

Ser Asn Pro Ile Glu Asn Leu Asp Lys Arg
 180 185

<210> 17
 <211> 693
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB2035 DNA sequence

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 ccaccctgtct tctccgtctc cgctctaaac cgctggctgt atgaaaacgaa agccgtcctg
 cggcaaacac tggcgaaaaac accggccggcc caaactgccc aaaaccggct gccccaaatcc
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 gcccgtatg tctgcataca cgaactctgc caccccgcccc atcccgacca cagccccggcc
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<210> 18
 <211> 230
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB2035 protein sequence

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 20 25 30

Thr His Thr Val Arg Ile Ser Val Pro Pro Cys Phe Ser Val Ser Ala
 35 40 45

Leu Asn Arg Trp Leu Tyr Glu Asn Glu Ala Val Leu Arg Gln Thr Leu
 50 55 60

Ala Lys Thr Pro Pro Pro Gln Thr Ala Glu Asn Arg Leu Pro Glu Ser
 65 70 75 80

Ile Leu Phe His Gly Arg Gln Leu Ala Leu Thr Ala His Gln Asp Thr
 85 90 95

Gln Ile Leu Leu Met Pro Ser Glu Ile Arg Val Pro Glu Gly Ala Pro
 100 105 110

Glu Lys Gln Leu Ala Leu Leu Arg Asp Phe Leu Glu Arg Gln Ala His
 115 120 125

Ser Tyr Leu Ile Pro Arg Leu Glu Arg His Ala Arg Thr Thr Gln Leu
 130 135 140

Phe Pro Ala Ser Ser Ser Leu Thr Ser Ala Lys Thr Phe Trp Gly Val
 145 150 155 160

Cys Arg Lys Thr Thr Gly Ile Arg Phe Asn Trp Arg Leu Val Gly Ala
 165 170 175

Pro Glu Tyr Val Ala Asp Tyr Val Cys Ile His Glu Leu Cys His Leu
 180 185 190

Ala His Pro Asp His Ser Pro Ala Phe Trp Glu Leu Thr Arg Arg Phe
 195 200 205

Ala Pro Tyr Thr Pro Lys Ala Lys Gln Trp Leu Lys Ile His Gly Arg
 210 215 220—

Glu Leu Phe Ala Leu Gly
 225 230

<210> 19
 <211> 1257
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB1351 DNA sequence

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 gatcgccacg aaatcgccga aaccgccttt gcccgcgtgc gccactatca aaaaatcagt 180
 accgcctac gccgtccgca cgccgcaggccg cgccaaagccg ctctcgccgc actgggtctc 240
 ggcagaagca ccaacatcag cccaaatccaa gacctgcttg atgaagaaga aacagcgttc 300
 ctcggcaatt taaaagcccg taaaaccgag ttttcagaca gcctgaatac cgccgcagaa 360
 ttggccgcaat ggctgggtgga acaactgaaa cagcattggc gccaagaaga aatcctcgct 420
 ttccggccgca gcatcaacca gcctgccccg ctcgacatcc gctcaacac tttgaaaggc 480
 aaacgcgata aagtgcgtgcc gctgttgcac gccgaaagtg ccgatgcaga ggcaacgcct 540
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 tttagacggca cactggaagt ccaagacgaa ggcagccagc tgcttgcctt attgggtgggc 660
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cttgcacacc	tcaaaccg	cg tatgacccgc	gc cggactga	ccaatata	cca cccgaa	840
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gtggacgcgc	cct gtc	ccgg tttggca	ta cccgac	ca aataccgc	960	
caatccgcgc	aa accgtc	gc caac cttt	gaa caga	ac agcatc	cgtatgcgc	1020
tccaaactgg	taaaaaccg	ca aggacgtt	tg tacgcca	cttgcagc	cctgccc	1080
gaaaacgagc	tgcaagt	cg acgttcc	tccgaacat	ccgaattt	gaa acccg	1140
tgccgcgaac	tgcttgc	ccgg tttgaaaat	gatttggata	ccggcaaa	ata cctgcgc	1200
aactccgccc	gacaccaaa	ac cgacggct	ttcgccc	tattgcaac	g caaaata	1257

<210> 20

<211> 418

<212> PRT

<213> Neisseria meningitidis serogroup B NMB1351 protein sequence

<400> 20

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Leu	Thr	Phe	Lys	Gln	Pro	Ala	Asp	Ala	Val	Leu	Ser	Ala	Tyr	Phe	Arg
		20					25					30			

Glu	His	Lys	Lys	Leu	Gly	Ser	Gln	Asp	Arg	His	Glu	Ile	Ala	Glu	Thr
		35				40				45					

Ala	Phe	Ala	Ala	Leu	Arg	His	Tyr	Gln	Ile	Ser	Thr	Ala	Leu	Arg	
		50			55			60							

Arg	Pro	His	Ala	Gln	Pro	Arg	Lys	Ala	Ala	Leu	Ala	Leu	Val	Leu	
	65				70			75				80			

Gly	Arg	Ser	Thr	Asn	Ile	Ser	Gln	Ile	Lys	Asp	Leu	Leu	Asp	Glu	Glu
		85				90			95						

Glu	Thr	Ala	Phe	Leu	Gly	Asn	Leu	Lys	Ala	Arg	Lys	Thr	Glu	Phe	Ser
		100				105			110						

Asp	Ser	Leu	Asn	Thr	Ala	Ala	Glu	Leu	Pro	Gln	Trp	Leu	Val	Glu	Gln
		115				120				125					

Leu	Lys	Gln	His	Trp	Arg	Glu	Glu	Ile	Leu	Ala	Phe	Gly	Arg	Ser	
	130				135				140						

Ile	Asn	Gln	Pro	Ala	Pro	Leu	Asp	Ile	Arg	Val	Asn	Thr	Leu	Lys	Gly
	145				150			155			160				

Lys	Arg	Asp	Lys	Val	Leu	Pro	Leu	Leu	Gln	Ala	Glu	Ser	Ala	Asp	Ala
		165				170			175						

Glu	Ala	Thr	Pro	Tyr	Ser	Pro	Trp	Gly	Ile	Arg	Leu	Lys	Asn	Lys	Ile
		180				185			190						

Ala	Leu	Asn	Lys	His	Glu	Leu	Phe	Leu	Asp	Gly	Thr	Leu	Glu	Val	Gln
		195			200				205						

Asp	Glu	Gly	Ser	Gln	Leu	Leu	Ala	Leu	Leu	Val	Gly	Ala	Lys	Arg	Gly
	210				215			220							

Glu	Ile	Ile	Val	Asp	Phe	Cys	Ala	Gly	Ala	Gly	Gly	Lys	Thr	Leu	Ala
	225			230			235			240					

Val Gly Ala Gln Met Ala Asn Lys Gly Arg Ile Tyr Ala Phe Asp Ile

245

250

255

Ala Glu Lys Arg Leu Ala Asn Leu Lys Pro Arg Met Thr Arg Ala Gly
 260 265 270

Leu Thr Asn Ile His Pro Glu Arg Ile Gly Ser Glu His Asp Ala Arg
 275 280 285

Ile Ala Arg Leu Ala Gly Lys Ala Asp Arg Val Leu Val Asp Ala Pro
 290 295 300

Cys Ser Gly Leu Gly Thr Leu Arg Arg Asn Pro Asp Leu Lys Tyr Arg
 305 310 315 320

Gln Ser Ala Glu Thr Val Ala Asn Leu Leu Glu Gln Gln His Ser Ile
 325 330 335

Leu Asp Ala Ala Ser Lys Leu Val Lys Pro Gln Gly Arg Leu Val Tyr
 340 345 350

Ala Thr Cys Ser Ile Leu Pro Glu Glu Asn Glu Leu Gln Val Glu Arg
 355 360 365

Phe Leu Ser Glu His Pro Glu Phe Glu Pro Val Asn Cys Ala Glu Leu
 370 375 380

Leu Ala Gly Leu Lys Ile Asp Leu Asp Thr Gly Lys Tyr Leu Arg Leu
 385 390 395 400

Asn Ser Ala Arg His Gln Thr Asp Gly Phe Phe Ala Ala Val Leu Gln
 405 410 415

Arg Lys

<210> 21
 <211> 1014

<212> DNA

<213> Neisseria meningitidis serogroup B NMB1574 DNA sequence

<400>	21			
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atcatcggtt	acggttcgca aggtcatgcc	catgccgcca acctgaaaaga	ttcgggtgt	120
aacgtggta	ttggctcgcg ccaaggttct	tcttggaaaa aagccgaagc	agccgggtcat	180
gtcgtcaaaa	ccgttgctga agcgacaaaa	gaagccgatg tcgttatgt	gtgtgtgcct	240
gacgaaacca	tgcctgcccgt ctatcacgcc	gaagttacag ccaatttgaa	agaaggcgca	300
acgctggcat	ttgcacacgg cttcaacgtg	cactacaacc aaatcggtcc	gcgtgcccac	360
ttggacgtga	ttatggttgc ccccaaaggt	ccggccata ccgtacgcag	tgaatacaca	420
cgcggcggcg	cgctgccttc tctgattgcc	gttaccaag acaattccgg	caaagccaaa	480
gacatcgccc	tgtcttatgc ggctccaaac	ggccgcacca aaggcggtgt	gattgaaacc	540
actttcccg	aagaaaccga aaccgatctg	ttccggcaac aagccgtatt	gtgcggcggc	600
gtggctcgagt	tgatcaaggc gggtttgaa	accctgaccg aagccgtta	cgcgcctgaa	660
atggcttaact	tcgaatgtct gcacgaaatg	aaactgatcg ttgacctgt	ttcgaaggc	720
ggtattgcca	atatgaacta ctccatcc	aacaatgcgg agtacggcga	atacgttacc	780
ggccctgaag	tggtaaatgc ttccagaaaa	gaagccatgc gcaatgccct	gaaacgcatt	840
caaaccggcg	aatacgcaaa aatgtttatc	caagagggta atgtcaacta	tgcgctatag	900
actccccggcc	gcccgtctgaa tgccgaccac	caagttgaaa aagtcggcgc	acaactgcgt	960
gccatgatgc	cttggattac tgccaacaaa	ttggttgacc aagacaaaaa	ctga	1014

<210> 22
 <211> 337

<212> PRT

<213> Neisseria meningitidis serogroup B NMB1574 protein sequence

<400> 22

Met Gln Val Tyr Tyr Asp Lys Asp Ala Asp Leu Ser Leu Ile Lys Gly
1 5 10 15

Lys Thr Val Ala Ile Ile Gly Tyr Gly Ser Gln Gly His Ala His Ala
20 25 30

Ala Asn Leu Lys Asp Ser Gly Val Asn Val Val Ile Gly Leu Arg Gln
35 40 45

Gly Ser Ser Trp Lys Lys Ala Glu Ala Ala Gly His Val Val Lys Thr
50 55 60

Val Ala Glu Ala Thr Lys Glu Ala Asp Val Val Met Leu Leu Pro
65 70 75 80

Asp Glu Thr Met Pro Ala Val Tyr His Ala Glu Val Thr Ala Asn Leu
85 90 95

Lys Glu Gly Ala Thr Leu Ala Phe Ala His Gly Phe Asn Val His Tyr
100 105 110

Asn Gln Ile Val Pro Arg Ala Asp Leu Asp Val Ile Met Val Ala Pro
115 120 125

Lys Gly Pro Gly His Thr Val Arg Ser Glu Tyr Lys Arg Gly Gly
130 135 140

Val Pro Ser Leu Ile Ala Val Tyr Gln Asp Asn Ser Gly Lys Ala Lys
145 150 155 160

Asp Ile Ala Leu Ser Tyr Ala Ala Asn Gly Gly Thr Lys Gly Gly
165 170 175

Val Ile Glu Thr Thr Phe Arg Glu Glu Thr Glu Thr Asp Leu Phe Gly
180 185 190

Glu Gln Ala Val Leu Cys Gly Gly Val Val Glu Leu Ile Lys Ala Gly
195 200 205

Phe Glu Thr Leu Thr Glu Ala Gly Tyr Ala Pro Glu Met Ala Tyr Phe
210 215 220

Glu Cys Leu His Glu Met Lys Leu Ile Val Asp Leu Ile Phe Glu Gly
225 230 235 240

Gly Ile Ala Asn Met Asn Tyr Ser Ile Ser Asn Asn Ala Glu Tyr Gly
245 250 255

Glu Tyr Val Thr Gly Pro Glu Val Val Asn Ala Ser Ser Lys Glu Ala
260 265 270

Met Arg Asn Ala Leu Lys Arg Ile Gln Thr Gly Glu Tyr Ala Lys Met
275 280 285

Phe Ile Gln Glu Gly Asn Val Asn Tyr Ala Ser Met Thr Ala Arg Arg
290 295 300

Arg Leu Asn Ala Asp His Gln Val Glu Lys Val Gly Ala Gln Leu Arg
305 310 315 320

Ala Met Met Pro Trp Ile Thr Ala Asn Lys Leu Val Asp Gln Asp Lys
325 330 335

Asn

<210> 23

<211> 693

<212> DNA

<213> Neisseria meningitidis serogroup B NMB1298 DNA sequence

<400> 23

atgaaactta tcaaataacct gcaatatcaa ggcataaggaa gccgcaagca gtgccaatgg
ctgattgccg gcggttatgt tttcatcaac ggaacctgca tggacgacac cgatgcagac
atcgattcct catccgtcga aacgttggat attgacgggg aagcagtaac cgtcggtccc
gaaccctatt tctacatcat gctcaacaag cctgaagatt acgaaacttc gcacaaaccc
aagcaactacc gcagcgtatt cagcctgttc cccgacaata tgccgaaacat cgatatgcag
gccccgtggca ggctggatgc agatacgacc ggctgtattgc tgattaccaa cgacggcaaa
ctgaaccaca gcctgacttc gccgagcaga aaaattccca agctgtacga agtaacgctc
aaacacccca caggagaaac gctctgcgaa accttgaaaa acggcgtgct gctccacgac
gaaaacgaaa ccgttgtgc cgccgatgccc gtttgaaaa acccgaccac cctgctgctg
accattaccc aaggaaaata ccaccaagtc aaacgcatga tcgcccgcg cggcaaccgc
gtgcaacacc ttcatcgccg gcgattcgca catctggaaa cagaaaacct caaaccggg
aatggaaat ttatcgaatg tccaaaattc tga 60
60
120
180
240
300
360
420
480
540
600
660
693

<210> 24

<211> 230

<212> PRT

<213> Neisseria meningitidis serogroup B NMB1298 protein sequence

<400> 24

Met Lys Leu Ile Lys Tyr Leu Gln Tyr Gln Gly Ile Gly Ser Arg Lys
1 5 10 15

Gln Cys Gln Trp Leu Ile Ala Gly Gly Tyr Val Phe Ile Asn Gly Thr
20 25 30

Cys Met Asp Asp Thr Asp Ala Asp Ile Asp Ser Ser Ser Val Glu Thr
35 40 45

Leu Asp Ile Asp Gly Glu Ala Val Thr Val Val Pro Glu Pro Tyr Phe
50 55 60

Tyr Ile Met Leu Asn Lys Pro Glu Asp Tyr Glu Thr Ser His Lys Pro
65 70 75 80

Lys His Tyr Arg Ser Val Phe Ser Leu Phe Pro Asp Asn Met Arg Asn
85 90 95

Ile Asp Met Gln Ala Val Gly Arg Leu Asp Ala Asp Thr Thr Gly Val
100 105 110

Leu Leu Ile Thr Asn Asp Gly Lys Leu Asn His Ser Leu Thr Ser Pro
115 120 125

Ser Arg Lys Ile Pro Lys Leu Tyr Glu Val Thr Leu Lys His Pro Thr
130 135 140

Gly Glu Thr Leu Cys Glu Thr Leu Lys Asn Gly Val Leu Leu His Asp
145 150 155 160

Glu Asn Glu Thr Val Cys Ala Ala Asp Ala Val Leu Lys Asn Pro Thr
165 170 175

Thr Leu Leu Leu Thr Ile Thr Glu Gly Lys Tyr His Gln Val Lys Arg
180 185 190

Met Ile Ala Ala Ala Gly Asn Arg Val Gln His Leu His Arg Arg Arg
195 200 205

Phe Ala His Leu Glu Thr Glu Asn Leu Lys Pro Gly Glu Trp Lys Phe
210 215 220

Ile Glu Cys Pro Lys Phe
225 230

<210> 25
<211> 900
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1856 DNA sequence

<400> 25
atgaaaacca attcagaaga actgaccgta tttgttcaag tggtggaaag cggcagcttc 60
agccgtgcgg cggagcagtt ggcgatggca aattctgccg taagccgcatt cgtcaaacagg 120
ctggaggaaa agttgggtgt gaacctgctc aaccgcacca cgcggcaact cagtctgacg 180
gaagaaggcg cgcaatattt ccgcgcgcg cagagaatcc tgcaagaaat ggcagcggcg 240
gaaaccgaaa tgctggcagt gcacgaaata ccgcaggcg tggtaggcgt ggattccgcg 300
atgcccgttgg tgctgcattt gctggcggccg ctgcgcacca aattcaacga acgctatccg 360
catatccgac ttctcgctgt ttcttccgaa ggcttatatca atctgattga acgcaaaggc 420
gatattgcct tacggccgg agaattggac gattccggc tgctgcacg ccatctgttt 480
gacagccgct tccgcgttaat ccgcaggctt gaatacctgg caaaacacgg cacgcccgg 540
tctacagaag agcttgcgg ccaccaatgt ttaggcttca ccgaacccgg ttctctaaat 600
acatggccgg ttttagatgc gcagggaaat ccctataaga tticaccgc ttaccggcc 660
agcagcggtg aaatcttacg ctgcgtgtgc cttaggtt gcggtattgt ttgcttatca 720
gattttttgg ttgacaacga catcgctgaa ggaaagttaa ttccccgttgc cgccgaacaa 780
acctccgata aaacacacccc cttaatgtc gtttattaca gcgataaagc cgtcaatctc 840
cgcttacgcg tatttttggaa ttttttagtg gaggaaactgg gaaacaatct ctgtggataa 900

<210> 26
<211> 299
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1856 protein sequence

<400> 26
Met Lys Thr Asn Ser Glu Glu Leu Thr Val Phe Val Gln Val Val Glu
1 5 10 15

Ser Gly Ser Phe Ser Arg Ala Ala Glu Gln Leu Ala Met Ala Asn Ser
20 25 30

Ala Val Ser Arg Ile Val Lys Arg Leu Glu Glu Lys Leu Gly Val Asn
35 40 45

Leu Leu Asn Arg Thr Thr Arg Gln Leu Ser Leu Thr Glu Glu Gly Ala
50 55 60

Gln Tyr Phe Arg Arg Ala Gln Arg Ile Leu Gln Glu Met Ala Ala Ala
65 70 75 80

Glu Thr Glu Met Leu Ala Val His Glu Ile Pro Gln Gly Val Leu Ser
 85 90 95
 Val Asp Ser Ala Met Pro Met Val Leu His Leu Leu Ala Pro Leu Ala
 100 105 110
 Ala Lys Phe Asn Glu Arg Tyr Pro His Ile Arg Leu Ser Leu Val Ser
 115 120 125
 Ser Glu Gly Tyr Ile Asn Leu Ile Glu Arg Lys Val Asp Ile Ala Leu
 130 135 140
 Arg Ala Gly Glu Leu Asp Asp Ser Gly Leu Arg Ala Arg His Leu Phe
 145 150 155 160
 Asp Ser Arg Phe Arg Val Ile Ala Ser Pro Glu Tyr Leu Ala Lys His
 165 170 175
 Gly Thr Pro Gln Ser Thr Glu Glu Leu Ala Gly His Gln Cys Leu Gly
 180 185 190
 Phe Thr Glu Pro Gly Ser Leu Asn Thr Trp Ala Val Leu Asp Ala Gln
 195 200 205
 Gly Asn Pro Tyr Lys Ile Ser Pro His Phe Thr Ala Ser Ser Gly Glu
 210 215 220
 Ile Leu Arg Ser Leu Cys Leu Ser Gly Cys Gly Ile Val Cys Leu Ser
 225 230 235 240
 Asp Phe Leu Val Asp Asn Asp Ile Ala Glu Gly Lys Leu Ile Pro Leu
 245 250 255
 Leu Ala Glu Gln Thr Ser Asp Lys Thr His Pro Phe Asn Ala Val Tyr
 260 265 270
 Tyr Ser Asp Lys Ala Val Asn Leu Arg Leu Arg Val Phe Leu Asp Phe
 275 280 285
 Leu Val Glu Glu Leu Gly Asn Asn Leu Cys Gly
 290 295
 <210> 27
 <211> 696
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0119 DNA sequence
 <400> 27
 atgatgaagg atttgaattt gagcaacagc ctgttcaaag gctacaacga caaaacatggc
 ttaatgattt gtggctatga atggggttgg agtaaagccg atgaggctgc ttatgttagca
 ggtgaataca aactccctga aaacaaaatc gaccatacat ttgcaaacaa atccctctat
 ttcggagagc aggcaaaaaa gtggcggtac gacaatacga taaaaaattg gtttgaatg
 tggggacacc ctttagacga aaatggattt ggcggtgcat ttgaaaaatc cctggttcaa
 accaactggg ctgctacaca gggcaacact atcgacaatc ccgacaagt cacacaaccc
 gagcacatcg ataattttct ctaccacatc gaaaaactgc gtccgaaagt catcctttc
 atgggcagca ggttggcggta ttttctgaac aacccaaatg tactgccacg cttcgagcag
 ttggctggta agcagaccaa accgctggag acggtgcaaa aagaatttga cggtacacgt
 ttcaatgtca aattccaatc gtttgaagat tgcgaaatc tctgcttcc ccatcccagt
 gccagtcgctg gcttatctta cgattacatc gccttggggc cgcctgaaat gaaccggatt
 ttatcgact taaaaacaac acgcggattc aaataa

<210> 28
<211> 231
<212> PRT
<213> Neisseria meningitidis serogroup B NMB0119 protein sequence

<400> 28
Met Met Lys Asp Leu Asn Leu Ser Asn Ser Leu Phe Lys Gly Tyr Asn
1 5 10 15
Asp Lys His Gly Leu Met Ile Cys Gly Tyr Glu Trp Gly Trp Ser Lys
20 25 30
Ala Asp Glu Ala Ala Tyr Val Ala Gly Glu Tyr Lys Leu Pro Glu Asn
35 40 45
Lys Ile Asp His Thr Phe Ala Asn Lys Ser Leu Tyr Phe Gly Glu Gln
50 55 60
Ala Lys Lys Trp Arg Tyr Asp Asn Thr Ile Lys Asn Trp Phe Glu Met
65 70 75 80
Trp Gly His Pro Leu Asp Glu Asn Gly Leu Gly Gly Ala Phe Glu Lys
85 90 95
Ser Leu Val Gln Thr Asn Trp Ala Ala Thr Gln Gly Asn Thr Ile Asp
100 105 110
Asn Pro Asp Lys Phe Thr Gln Pro Glu His Ile Asp Asn Phe Leu Tyr
115 120 125
His Ile Glu Lys Leu Arg Pro Lys Val Ile Leu Phe Met Gly Ser Arg
130 135 140
Leu Ala Asp Phe Leu Asn Asn Gln Asn Val Leu Pro Arg Phe Glu Gln
145 150 155 160
Leu Val Gly Lys Gln Thr Lys Pro Leu Glu Thr Val Gln Lys Glu Phe
165 170 175
Asp Gly Thr Arg Phe Asn Val Lys Phe Gln Ser Phe Glu Asp Cys Glu
180 185 190
Val Val Cys Phe Pro His Pro Ser Ala Ser Arg Gly Leu Ser Tyr Asp
195 200 205
Tyr Ile Ala Leu Phe Ala Pro Glu Met Asn Arg Ile Leu Ser Asp Phe
210 215 220
Lys Thr Thr Arg Gly Phe Lys
225 230

<210> 29
<211> 1065
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1705 DNA sequence

<400> 29
atggaaaaag aattcaggat attaaatatac gtatcgccca agatttgggg tggaggcgaa 60
caatatgtct atgatgtttc aaaagcattg gggcttcggg gctgcacaat gtttaccgcc 120
gtcaataaaa ataatgaatt gatgcacagg cgattttccg aagtttcttc cgttttcaca 180
acgcgccttc acacgctcaa cgggctgttt tcgctctacg cacttaccccg ctttatccgg 240

aaaaaccgca tttcccaccc gatgatacac accggcaaaa ttgccgcctt atccatactt 300
tgaaaaaac tgaccgggt ggcctgata tttgtcaaac ataatgtcgt cgccaacaaa 360
accgatttt accaccgcct gatacagaaaa aacacagacc gctttatccg cgtttcccg 420
ctggtttacg atgtcaaac cgccgacaat ccctttaaag aaaaataccg gattgttcat 480
aaccggtatcg ataccggccg tttccctccc tctcaagaaaa aacccgacag ccgtttttt 540
accgtcgct acgccccgac gatcagtccaa gaaaaaggat tggaaaacct gattgaagcc 600
tgtgtgatac tgcattcgaa atatcctcaa atcaggctca aattggcagg ggacggacat 660
ccggattata tgcggccct gaagcgggac gtatctgctt caggagcaga accatttgg 720
tcttttgaag gtttaccga aaaacttgc tcgttttacc gccaaagcga tgcgtgggt 780
ttgcccagcc tcgtcccgga ggcattcggt ttgtcattat gcgaggcgat gtactgccc 840
acggcggtga ttccaatac tttggggcga caaaaggaaaa ttgtcaaca tcataatcg 900
gggattctgc tggacaggct gacacctgaa tcttggcgg acgaaatcga acgcctcg 960
ttgaaccctg aaacgaaaaa cgactggca acggcagctc atcaatgcgt cgccgccc 1020
tttaccatca accataccgc cgacaaatta ttggatgcaa tataa 1065

<210> 30
<211> 354
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1705 protein sequence

<400> 30
Met Glu Lys Glu Phe Arg Ile Leu Asn Ile Val Ser Ala Lys Ile Trp
1 5 10 15

Gly Gly Gly Glu Gln Tyr Val Tyr Asp Val Ser Lys Ala Leu Gly Leu
20 25 30

Arg Gly Cys Thr Met Phe Thr Ala Val Asn Lys Asn Asn Glu Leu Met
35 40 45

His Arg Arg Phe Ser Glu Val Ser Ser Val Phe Thr Thr Arg Leu His
50 55 60

Thr Leu Asn Gly Leu Phe Ser Leu Tyr Ala Leu Thr Arg Phe Ile Arg
65 70 75 80

Lys Asn Arg Ile Ser His Leu Met Ile His Thr Gly Lys Ile Ala Ala
85 90 95

Leu Ser Ile Leu Leu Lys Lys Leu Thr Gly Val Arg Leu Ile Phe Val
100 105 110

Lys His Asn Val Val Ala Asn Lys Thr Asp Phe Tyr His Arg Leu Ile
115 120 125

Gln Lys Asn Thr Asp Arg Phe Ile Cys Val Ser Arg Leu Val Tyr Asp
130 135 140

Val Gln Thr Ala Asp Asn Pro Phe Lys Glu Lys Tyr Arg Ile Val His
145 150 155 160

Asn Gly Ile Asp Thr Gly Arg Phe Pro Pro Ser Gln Glu Lys Pro Asp
165 170 175

Ser Arg Phe Phe Thr Val Ala Tyr Ala Gly Arg Ile Ser Pro Glu Lys
180 185 190

Gly Leu Glu Asn Leu Ile Glu Ala Cys Val Ile Leu His Arg Lys Tyr
195 200 205

Pro Gln Ile Arg Leu Lys Leu Ala Gly Asp Gly His Pro Asp Tyr Met

210

215

220

Cys Arg Leu Lys Arg Asp Val Ser Ala Ser Gly Ala Glu Pro Phe Val
 225 230 235 240

Ser Phe Glu Gly Phe Thr Glu Lys Leu Ala Ser Phe Tyr Arg Gln Ser
 245 250 255

Asp Val Val Val Leu Pro Ser Leu Val Pro Glu Ala Phe Gly Leu Ser
 260 265 270

Leu Cys Glu Ala Met Tyr Cys Arg Thr Ala Val Ile Ser Asn Thr Leu
 275 280 285

Gly Ala Gln Lys Glu Ile Val Glu His His Gln Ser Gly Ile Leu Leu
 290 295 300

Asp Arg Leu Thr Pro Glu Ser Leu Ala Asp Glu Ile Glu Arg Leu Val
 305 310 315 320

Leu Asn Pro Glu Thr Lys Asn Ala Leu Ala Thr Ala Ala His Gln Cys
 325 330 335

Val Ala Ala Arg Phe Thr Ile Asn His Thr Ala Asp Lys Leu Leu Asp
 340 345 350

Ala Ile

<210> 31
<211> 1272
<212> DNA
<213> Neisseria meningitidis serogroup B NMB2065 DNA sequence

<400> 31
atgcaggaac agaatcgaa accaagtttt cccatagtga tggctgtgg gtcgggtgcc 60
ctgtggatacg cgtctttatc caatgttgc ttttatttgg gcaatcatgg aagcatggag 120
ggtttgaccg ttgttattttt ggggtcgata ttgcgttctt tggatatcg gtattgtgcg 180
gtctatgcga attatgtttt gttggcgccc attgttttgc tggcgttgcg gaagaaggc 240
gtgcctgtcc atgcggcact ttggggcttg gcgttggtgg ctttcagtgt gaaaggcgtta 300
tacgtcgatg aagcaggaa tacatcgatg atttgtgcgt acgggtgcagg attttatttg 360
tggtatgccc catttgcgt tgccaccatc ggtacgtttt ccggaaagaa taaggaaaga 420
aaagccgcatt cagcggcaga cgggataaaa atgacgtttt ataaatggtt gggcttgc 480
aaactgccta aaaatgaagc aagaatgtcg ctacaatatg tttcggata tacgcgcgtg 540
cagttgttgc cgccccccgg ggaagaaaatg ccggacagaag tccgacagcg gcggacagg 600
ctggcgcaac gccgtctgaa cggcgagccg gttgcctata ttttaggtgt ggcgttgc 660
tatggcagac gctttacagt caatccgagc gtgctgattt cgcgcggccaa aaccgaacat 720
ttggtgcgaaat ccgtatttgc gcgcctgccc gaaaacgggc gcgtgtgggaa ttggggacg 780
ggcagcgcg cgggtgcgtt aaccgtcgcc ctgcacgcgc ccgatgcgtt tgcgcgc 840
tccgacatca gccccccgc ccttgaacacg ggcggaaaa atgcggcggaa ttggggcgc 900
cggtgcgaaat ttgcacacgg ttgcgtgggatc gacaccgata tgccgtctga agggaaatgg 960
gacatcatcg tgcacaccc gcccataatc gaaaacggcg ataaacattt gttgcagac 1020
gatttgcgtt ttgagccgaa atgcgcgtt accgactttt cagacggcct aagctgcac 1080
cgcaccttgc cgcaaggcgc gcccggccgt ttggcggaaag gcggttttt attgcgtggaa 1140
cacggtttgc atcaggcgc ggcggcgc ggcgtgtgg cggagaatgg ttttcagga 1200
gtggaaatccc tgccggattt ggccgggttgc gacagggttgc cgctgggaa gtatatgaag 1260
catttgcgaaat aa 1272

<210> 32
<211> 423
<212> PRT

<213> Neisseria meningitidis serogroup B NMB2065 protein sequence

<400> 32
Met Gln Glu Gln Asn Arg Lys Pro Ser Phe Pro Ile Val Met Leu Leu
1 5 10 15
Val Ser Val Ala Leu Trp Ile Ala Ser Leu Ser Asn Val Ala Phe Tyr
20 25 30
Leu Gly Asn His Gly Ser Met Glu Gly Leu Thr Val Leu Ile Leu Gly
35 40 45
Ser Ile Phe Ala Ser Leu Asp Ile Arg Tyr Cys Ala Val Tyr Ala Asn
50 55 60
Tyr Val Trp Leu Ala Ala Ile Val Leu Leu Ala Leu Arg Lys Lys Val
65 70 75 80
Val Pro Val His Ala Ala Leu Trp Gly Leu Ala Leu Val Ala Phe Ser
85 90 95
Val Lys Ala Val Tyr Val Asp Glu Ala Gly Asn Thr Ser Asp Ile Val
100 105 110
Arg Tyr Gly Ala Gly Phe Tyr Leu Trp Tyr Ala Ala Phe Ala Val Ala
115 120 125
Thr Ile Gly Thr Phe Ala Gly Lys Asn Lys Glu Arg Lys Ala Ala Ser
130 135 140
Ala Ala Asp Gly Ile Lys Met Thr Phe Asp Lys Trp Leu Gly Leu Ser
145 150 155 160
Lys Leu Pro Lys Asn Glu Ala Arg Met Leu Leu Gln Tyr Val Ser Glu
165 170 175
Tyr Thr Arg Val Gln Leu Leu Thr Arg Gly Glu Glu Met Pro Asp
180 185 190
Glu Val Arg Gln Arg Ala Asp Arg Leu Ala Gln Arg Arg Leu Asn Gly
195 200 205
Glu Pro Val Ala Tyr Ile Leu Gly Val Arg Glu Phe Tyr Gly Arg Arg
210 215 220
Phe Thr Val Asn Pro Ser Val Leu Ile Pro Arg Pro Glu Thr Glu His
225 230 235 240
Leu Val Glu Ala Val Leu Ala Arg Leu Pro Glu Asn Gly Arg Val Trp
245 250 255
Asp Leu Gly Thr Gly Ser Gly Ala Val Ala Val Thr Val Ala Leu Glu
260 265 270
Arg Pro Asp Ala Phe Val Arg Ala Ser Asp Ile Ser Pro Pro Ala Leu
275 280 285
Glu Thr Ala Arg Lys Asn Ala Ala Asp Leu Gly Ala Arg Val Glu Phe
290 295 300
Ala His Gly Ser Trp Phe Asp Thr Asp Met Pro Ser Glu Gly Lys Trp

305	310	315	320
Asp Ile Ile Val Ser Asn Pro Pro Tyr Ile Glu Asn Gly Asp Lys His			
325		330	335
Leu Leu Gln Gly Asp Leu Arg Phe Glu Pro Gln Ile Ala Leu Thr Asp			
340		345	350
Phe Ser Asp Gly Leu Ser Cys Ile Arg Thr Leu Ala Gln Gly Ala Pro			
355		360	365
Asp Arg Leu Ala Glu Gly Gly Phe Leu Leu Leu Glu His Gly Phe Asp			
370	375	380	
Gln Gly Ala Ala Val Arg Gly Val Leu Ala Glu Asn Gly Phe Ser Gly			
385	390	395	400
Val Glu Thr Leu Pro Asp Leu Ala Gly Leu Asp Arg Val Thr Leu Gly			
405		410	415
Lys Tyr Met Lys His Leu Lys			
420			

<210> 33
<211> 1170
<212> DNA
<213> Neisseria meningitidis serogroup B NMB0339 DNA sequence

<400> 33

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<400> 34

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 Ala Ala Ile Glu Gln Gln Asn His Ala Tyr Leu Ser Met Val Gly Glu
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 Asn Val Val Tyr Glu Lys Ser Leu Leu Leu Lys Cys Glu Lys Glu Ala
 290 295 300
 Ala Gln Thr Ala Val Glu Leu Val Arg Arg Lys Pro Asp Leu Asn Gly
 305 310 315 320
 Val Tyr Arg Leu Leu Gly Leu Lys Leu Ser Asp Met Asn Pro Ala Trp
 325 330 335
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Arg Ser Val Met Tyr Arg Cys Arg Asn Cys His Phe Lys Ser Gln Val
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Asn Lys Ile Glu Val
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<213> Neisseria meningitidis serogroup B NMB0401 DNA sequence

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<212> PRT

<213> Neisseria meningitidis serogroup B NMB0401 protein sequence

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35 40 45

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50 55 60

Gly Val Asp Ala Leu Met His Glu Phe Ser Leu Ser Ser Glu Glu Gly
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85 90 95

Ala Thr Arg Asp Arg Leu Ile Ala Asp Lys Ile Ser Asp Gly Asn Trp
100 105 110

Lys Ser His Leu Asn Asn Ser Pro Ser Leu Phe Val Asn Ala Ala Ala
115 120 125

Trp Gly Leu Leu Ile Thr Gly Lys Leu Thr Ala Thr Asn Asp Lys Gln
130 135 140

Met Ser Ser Ala Leu Ser Arg Leu Ile Ser Lys Gly Gly Ala Pro Leu
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Val Thr Gly Gln Thr Ile Glu Glu Ala Leu Gln Asn Gly Lys Glu Arg
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Glu Lys Met Gly Tyr Arg Phe Ser Phe Asp Met Leu Gly Glu Ala Ala
195 200 205

Tyr Thr Gln Ala Asp Ala Asp Arg Tyr Tyr Arg Asp Tyr Val Glu Ala
210 215 220

Ile His Ala Ile Gly Lys Asp Ala Ala Gly Gln Gly Val Tyr Glu Gly
225 230 235 240

Asn Gly Ile Ser Val Lys Leu Ser Ala Ile His Pro Arg Tyr Ser Arg
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Thr Gln His Gly Arg Val Met Gly Glu Leu Leu Pro Arg Leu Lys Glu
260 265 270

Leu Phe Leu Leu Gly Lys Lys Tyr Asp Ile Gly Ile Asn Ile Asp Ala
275 280 285

Glu Glu Ala Asn Arg Leu Glu Leu Ser Leu Asp Leu Met Glu Ala Leu
290 295 300

Val Ser Asp Pro Asp Leu Ala Gly Tyr Lys Gly Ile Gly Phe Val Val
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Gln Ala Tyr Gln Lys Arg Cys Pro Phe Val Ile Asp Tyr Leu Ile Asp
325 330 335

Leu Ala Arg Arg Asn Asn Gln Lys Leu Met Ile Arg Leu Val Lys Gly
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Ala Tyr Trp Asp Ser Glu Ile Lys Trp Ala Gln Val Asp Gly Leu Asn
355 360 365

Gly Tyr Pro Thr Tyr Thr Arg Lys Val His Thr Asp Ile Ser Tyr Leu
370 375 380

Ala Cys Ala Arg Lys Leu Leu Ser Ala Gln Asp Ala Val Phe Pro Gln
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Phe Ala Thr His Asn Ala Tyr Thr Leu Gly Ala Ile Tyr Gln Met Gly
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Lys Gly Lys Asp Phe Glu His Gln Cys Leu His Gly Met Gly Glu Thr
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Leu Tyr Asp Gln Val Val Gly Pro Gln Asn Leu Gly Arg Arg Val Arg
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Val Tyr Ala Pro Val Gly Thr His Glu Thr Leu Leu Ala Tyr Leu Val
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Arg Arg Leu Leu Glu Asn Gly Ala Asn Ser Ser Phe Val Asn Gln Ile
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Val Asp Glu Asn Ile Ser Ile Asp Thr Leu Ile Arg Ser Pro Phe Asp
485 490 495

Thr Ile Ala Glu Gln Gly Ile His Leu His Asn Ala Leu Pro Leu Pro
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Arg Asp Leu Tyr Gly Lys Cys Arg Leu Asn Ser Gln Gly Val Asp Leu
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535

540

Ala Ala Gln Asp Phe His Ala Ala Ser Ile Val Asn Gly Lys Ala Arg
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Asp Val Gly Glu Ala Gln Pro Ile Lys Asn Pro Ala Asp His Asp Asp
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Ile Val Gly Thr Val Ser Phe Ala Asp Ala Ala Leu Ala Gln Glu Ala
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Val Gly Ala Ala Val Ala Ala Phe Pro Glu Trp Ser Ala Thr Pro Ala
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Ala Glu Arg Ala Ala Cys Leu Arg Arg Phe Ala Asp Leu Leu Glu Gln
 610 615 620

His Thr Pro Ala Leu Met Met Leu Ala Val Arg Glu Ala Gly Lys Thr
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Leu Asn Asn Ala Ile Ala Glu Val Arg Glu Ala Val Asp Phe Cys Arg
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Tyr Tyr Ala Asn Glu Ala Glu His Thr Leu Pro Gln Asp Ala Lys Ala
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Val Gly Ala Ile Val Ala Ile Ser Pro Trp Asn Phe Pro Leu Ala Ile
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Phe Thr Gly Glu Val Val Ser Ala Leu Ala Ala Gly Asn Thr Val Ile
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Ala Lys Pro Ala Glu Gln Thr Ser Leu Ile Ala Gly Tyr Ala Val Ser
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Leu Met His Glu Ala Gly Ile Pro Thr Ser Ala Leu Gln Leu Val Leu
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Gly Ala Gly Asp Val Gly Ala Ala Leu Thr Asn Asp Ala Arg Ile Gly
 740 745 750

Gly Val Ile Phe Thr Gly Ser Thr Glu Val Ala Arg Leu Ile Asn Lys
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Ala Leu Ala Lys Arg Gly Asp Asn Pro Val Leu Ile Ala Glu Thr Gly
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Gly Gln Asn Ala Met Ile Val Asp Ser Thr Ala Leu Ala Glu Gln Val
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Cys Ala Asp Val Leu Asn Ser Ala Phe Asp Ser Ala Gly Gln Arg Cys
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Ser Ala Leu Arg Ile Leu Cys Val Gln Glu Asp Val Ala Asp Arg Met
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Leu Asp Met Ile Lys Gly Ala Met Asp Glu Leu Val Val Gly Lys Pro
 835 840 845

Ile Gln Leu Thr Thr Asp Val Gly Pro Val Ile Asp Ala Glu Ala Gln
 850 855 860

Gln Asn Leu Leu Asn His Ile Asn Lys Met Lys Gly Val Ala Lys Ser
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 Tyr His Glu Val Lys Thr Ala Ala Asp Val Asp Ser Lys Lys Ser Thr
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 Arg Glu Val Phe Gly Pro Val Leu His Val Val Arg Tyr Arg Ala Asp
 915 920 925
 Glu Leu Asp Asn Val Ile Asp Gln Ile Asn Ser Lys Gly Tyr Ala Leu
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 Thr His Gly Val His Ser Arg Ile Glu Gly Thr Val Arg His Ile Arg
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 Ser Arg Ile Glu Ala Gly Asn Val Tyr Val Asn Arg Asn Ile Val Gly
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 Ala Val Val Gly Val Gln Pro Phe Gly Gly His Gly Leu Ser Gly Thr
 980 985 990
 Gly Pro Lys Ala Gly Gly Ser Phe Tyr Leu Gln Lys Leu Thr Arg Ala
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 Gly Glu Trp Val Ala Pro Thr Leu Ser Gln Ile Gly Gln Ala Asp Glu
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 Ala Asp Leu Glu Gly Leu Leu Val Asn Gly Lys Pro Glu Thr Ala
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 Gly Ile Ser His Val Ala Ala Leu Ser Pro Leu Asp Ser Ala Arg Lys
 1140 1145 1150
 Gln Glu Leu Ala Ala His Asp Gly Ala Leu Ile Arg Ile Leu Pro Ser
 1155 1160 1165
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<211> 1509
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1467 DNA sequence

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<210> 38
<211> 323
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1467 protein sequence

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Asp Lys Asn Ser Ala Ala Ser Ala Asp Cys Ala Lys Gly Arg Arg Gly
35 40 45

Arg Val Arg Ala Val Ala Thr Asn Thr Arg Val Ala Lys Asn Ala Asp
50 55 60

Lys Ala Ala Ala Gly Ala Gly Arg Ala Arg Tyr Thr Gly Val His Thr
65 70 75 80

Gly Gly Gly Lys Met Val Asp Gly Gly Ser Thr Val Gly Ser Thr

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90

95

Asn Asp Thr Ser Gly Cys Val Thr Tyr Ser Arg Asn Lys Thr Ala Lys
 100 105 110

Asp Ser Ala Ser Ala Ala Arg Asn Arg Ser Lys Asn Met Arg Arg Gly
 115 120 125

Trp Asp Ala Val Gly Thr Ser Gly Ser Ala Lys Ser Arg Asp Val Ala
 130 135 140

Ala Met Ala Asp Thr Tyr Lys Gly Met Arg Ala Ala Arg Ala Gly Ser
 145 150 155 160

Val Lys Lys Ala Lys Asn Lys Arg Val Ala Gly Gly Ala Val Met Met
 165 170 175

Ala Ala Met Lys Asp Arg Met Thr Val Thr Ala Ala Arg Asp Gly Val
 180 185 190

Tyr Asp Gly Arg Gly Asn Asp Met Arg Gly Thr Val Ala His Arg Tyr
 195 200 205

His Val Ser Asn Ala Lys Arg Thr Ala Thr Ala Thr Met Asp Ser Cys
 210 215 220

His Ala Lys Asn Val Thr Val Ala Trp Tyr Gly Arg Ala Ala Ala His
 225 230 235 240

Gly Asp Ala His Thr Gly Tyr His Lys His Ser Ala Tyr Asn Ala Asp
 245 250 255

Met Gly Ser Arg Lys Thr Ala Val Gly His Arg Gly Asp Met Lys Lys
 260 265 270

Met Ser Gly Gly Thr Asn Met Trp Tyr Ala Val Ser Arg Ala Ala Cys
 275 280 285

Arg Ser Arg Asp Ser Lys Asn Met Arg Thr Asp Thr Ser Cys Gly Arg
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Asp Arg Trp Arg His Ala Asp Ala Tyr Ser Val Trp Lys Asn Met Lys
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<210> 39
 <211> 393
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB2056 DNA sequence

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<210> 40
<211> 130
<212> PRT
<213> Neisseria meningitidis serogroup B NMB2056 protein sequence

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20 25 30

Arg Pro Val Asp Glu Phe Phe Ala Arg Glu Thr Ser Arg Met Val Val
35 40 45

Arg Gln Pro Leu Val Leu Thr Glu Asn Ala Glu Ser Phe Asp Ile Lys
50 55 60

Val Asn Val Val Gly Gly Glu Thr Gly Gln Ser Gly Ala Ile Arg
65 70 75 80

His Gly Ile Thr Arg Ala Leu Ile Asp Phe Asp Ala Ala Leu Lys Pro
85 90 95

Ala Leu Ser Gln Ala Gly Phe Val Thr Arg Asp Ala Arg Glu Val Glu
100 105 110

Arg Lys Lys Pro Gly Leu Arg Lys Ala Arg Arg Ala Lys Gln Phe Ser
115 120 125

Lys Arg
130

<210> 41
<211> 567
<212> DNA
<213> Neisseria meningitidis serogroup B NMB0808 DNA sequence

<400> 41
atgtccgccc tcctccccat catcaaccgc ctgattctgc aaagcccgaa cagccgctcg 60
gaacttgcgg ccttgcagg caaaacactg accctgaaca ttgcggggct gaaaactggcg 120
ggacgcatca cgaaagacgg tttgctctcg gcgggaaacg gctttgcaga caccgaaatt 180
accttcggca acagcgcggt acagaaaatc ctccaaggag gcaaacccgg ggcggggcgc 240
atcgggctcg aaggcgacct catcctcggc atcgcggtag tgcctctgt cggcagcctg 300
cggtcccgcg catcgacga attggcacgg atttcggca cgcaggcaga catcgccgc 360
cgtgccggcg acatcgacaa cggcatcaaa caaatcgca ggaacatcgc cgaacaaatc 420
ggcggatttt ccccgaaatc cgagtccgca aacatcgca acgaagccct tgccgactgc 480
ctcgacgaaa taagcagact ggcgcacggc gtggAACGCC tcaacgaaacg cctcgaccgg 540
ctcgaacgcg acatggat agactaa 567

<210> 42
<211> 188
<212> PRT
<213> Neisseria meningitidis serogroup B NMB0808 protein sequence

<400> 42
Met Ser Ala Leu Leu Pro Ile Ile Asn Arg Leu Ile Leu Gln Ser Pro
1 5 10 15

Asp Ser Arg Ser Glu Leu Ala Ala Phe Ala Gly Lys Thr Leu Thr Leu
20 25 30

Asn Ile Ala Gly Leu Lys Leu Ala Gly Arg Ile Thr Glu Asp Gly Leu
35 40 45

Leu Ser Ala Gly Asn Gly Phe Ala Asp Thr Glu Ile Thr Phe Arg Asn
50 55 60

Ser Ala Val Gln Lys Ile Leu Gln Gly Glu Pro Gly Ala Gly Asp
65 70 75 80

Ile Gly Leu Glu Gly Asp Leu Ile Leu Gly Ile Ala Val Leu Ser Leu
85 90 95

Leu Gly Ser Leu Arg Ser Arg Ala Ser Asp Glu Leu Ala Arg Ile Phe
100 105 110

Gly Thr Gln Ala Asp Ile Gly Ser Arg Ala Ala Asp Ile Gly His Gly
115 120 125

Ile Lys Gln Ile Gly Arg Asn Ile Ala Glu Gln Ile Gly Gly Phe Ser
130 135 140

Arg Glu Ser Glu Ser Ala Asn Ile Gly Asn Glu Ala Leu Ala Asp Cys
145 150 155 160

Leu Asp Glu Ile Ser Arg Leu Arg Asp Gly Val Glu Arg Leu Asn Glu
165 170 175

Arg Leu Asp Arg Leu Glu Arg Asp Ile Trp Ile Asp
180 185

<210> 43

<211> 627

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0774 DNA sequence

<400> 43

atgaacgtta atgttatcaa-ccatccgctc gtccgccaca aattaaccct gatgagggag 60
gcgggattgca gcacctacaa attccggacg cttgccaccg agctggcg cg cctgatggca 120
tacgaggcaa gccgtgattt taaaatcgaa aaatacctta tcgacggatg gtgcggtcag 180
attgaaggcg accgcataa gggcaaaaca ttgaccgtcg ttcccatact gcgtgcaggt 240
ttgggtatgc ttgacggtgt gctgacactg attccgactg cccaaatcag ttagtgcgga 300
ctgcagcgcg acgaagaaac gctgaaggct attccctatt ttgagaaatt tggacagt 360
atggacgaac gtccggctt gattatcgat cctatgctgg cgacaggcgg ttcgatgggt 420
gccaccatcg acctttgaa agccaaggc tgcaaaaata tcaaggcact ggtgctgggt 480
gccgcgcccc agggtgtgaa ggccgtcaac gacgcgcacc ctgacgttac gatttacacc 540
gccgcgctcg acagccactt gaacgagaac ggctacatca tccccggctt gggcgatgcg 600
ggcgacaaga ttttcggcac gcgctaa 627

<210> 44

<211> 208

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0774 protein sequence

<400> 44

Met Asn Val Asn Val Ile Asn His Pro Leu Val Arg His Lys Leu Thr
1 5 10 15

Leu Met Arg Glu Ala Asp Cys Ser Thr Tyr Lys Phe Arg Thr Leu Ala
20 25 30

Thr Glu Leu Ala Arg Leu Met Ala Tyr Glu Ala Ser Arg Asp Phe Glu
 35 40 45
 Ile Glu Lys Tyr Leu Ile Asp Gly Trp Cys Gly Gln Ile Glu Gly Asp
 50 55 60
 Arg Ile Lys Gly Lys Thr Leu Thr Val Val Pro Ile Leu Arg Ala Gly
 65 70 75 80
 Leu Gly Met Leu Asp Gly Val Leu Asp Leu Ile Pro Thr Ala Lys Ile
 85 90 95
 Ser Val Val Gly Leu Gln Arg Asp Glu Glu Thr Leu Lys Pro Ile Ser
 100 105 110
 Tyr Phe Glu Lys Phe Val Asp Ser Met Asp Glu Arg Pro Ala Leu Ile
 115 120 125
 Ile Asp Pro Met Leu Ala Thr Gly Gly Ser Met Val Ala Thr Ile Asp
 130 135 140
 Leu Leu Lys Ala Lys Gly Cys Lys Asn Ile Lys Ala Leu Val Leu Val
 145 150 155 160
 Ala Ala Pro Glu Gly Val Lys Ala Val Asn Asp Ala His Pro Asp Val
 165 170 175
 Thr Ile Tyr Thr Ala Ala Leu Asp Ser His Leu Asn Glu Asn Gly Tyr
 180 185 190
 Ile Ile Pro Gly Leu Gly Asp Ala Gly Asp Lys Ile Phe Gly Thr Arg
 195 200 205

<210> 45
 <211> 657
 <212> DNA
 <213> Neisseria meningitidis serogroup B-NMB0778 DNA sequence

<400> 45
 ttggcggtta cttaatgcg tcgcgccatg atacgtaaaa tgcctatac ggaagatatg 60
 cggccaggcg ataccgctaa tccttatggt gcgtccaaag cgatggtgg acggatgtta 120
 accgacatcc aaaaagccga tccgcgtgg agcatgattt tggtgcgtta tttcaatccg 180
 attggcgccg atgaaagcgg cttgattggc gagcagccaa acggcatccc gaataatttg 240
 ttgcctata tctgccaagt ggcggcaggc aaactgccc aattggcggt attggcgat 300
 gactacccta ccccccacgg cacggggatg cgtgactata ttcatgtat ggatttggca 360
 gaaggccatg tcgcccgtat gcaggcaaaa agtaatgtat caggcacgca tttgctgaac 420
 ttaggctccg gccgcgttc ttccgtttt gaaatcatcc ggcatttga agcagcttcg 480
 gttttgacga ttccgtatga agtcaaaccg cgcgcgtggc gtgatttggc gtgcatttat 540
 gccgaccctt cctataaaaa ggcgcaaatac ggctggcaaa cccagcgtga tttaacccaa 600
 atgatggaaag actcatggcg ctgggtgagt aataatccga atggctacga cgattaa 657

<210> 46
 <211> 218
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0778 protein sequence

<400> 46
 Met Ala Phe Thr Leu Met Arg Arg Ala Met Ile Arg Lys Met Pro Tyr
 1 5 10 15

Thr Glu Asp Met Arg Pro Gly Asp Thr Ala Asn Pro Tyr Gly Ala Ser
 20 25 30
 Lys Ala Met Val Glu Arg Met Leu Thr Asp Ile Gln Lys Ala Asp Pro
 35 40 45
 Arg Trp Ser Met Ile Leu Leu Arg Tyr Phe Asn Pro Ile Gly Ala His
 50 55 60
 Glu Ser Gly Leu Ile Gly Glu Gln Pro Asn Gly Ile Pro Asn Asn Leu
 65 70 75 80
 Leu Pro Tyr Ile Cys Gln Val Ala Ala Gly Lys Leu Pro Gln Leu Ala
 85 90 95
 Val Phe Gly Asp Asp Tyr Pro Thr Pro Asp Gly Thr Gly Met Arg Asp
 100 105 110
 Tyr Ile His Val Met Asp Leu Ala Glu Gly His Val Ala Ala Met Gln
 115 120 125
 Ala Lys Ser Asn Val Ala Gly Thr His Leu Leu Asn Leu Gly Ser Gly
 130 135 140
 Arg Ala Ser Ser Val Leu Glu Ile Ile Arg Ala Phe Glu Ala Ala Ser
 145 150 155 160
 Gly Leu Thr Ile Pro Tyr Glu Val Lys Pro Arg Arg Ala Gly Asp Leu
 165 170 175
 Ala Cys Phe Tyr Ala Asp Pro Ser Tyr Thr Lys Ala Gln Ile Gly Trp
 180 185 190
 Gln Thr Gln Arg Asp Leu Thr Gln Met Met Glu Asp Ser Trp Arg Trp
 195 200 205
 Val Ser Asn Asn Pro Asn Gly Tyr Asp Asp
 210 215

<210> 47
 <211> 999
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0337 DNA sequence

<400> 47
 atgagcagac ccgtacccgc cgtattcgac agcgaaaaat gccccgtcctc 60
 gcctaccgcg aaggcaaatg gcagccgacc gaatggcaat ctccccaaaga cctctccctc 120
 qcaccggggcg cgcacgcccgc gcactacggc agcgaatgtt tcgaggggact gaaaggcttc 180
 cgtcaggcag acggcaaaaat cgtgctgttc cgtccgactg ccaatatcgc gcgttatgcgg 240
 caaagtgcgg acattttgc cctgccgcgc cccgaaaccg aagcttatct tgacgcgcta 300
 atcaaattgg tcaaaacgtgc cgccgatgaa attcccgatg cgcctgccgc cctgtacctg 360
 cgtccgacct taatcggtac cgatcccgtt atccggcaagg ccggttctcc ttccgaaacc 420
 gcccgttgt atattttggc ttccccccgtc ggcgactatt tcaaagtgcgg atcgcccggtc 480
 aaaattttgg tggaaaaccga acacatccgc tgcccccgc atatggccg cgtcaaatgc 540
 ggcggcaact acgcttccgc catgcactgg gtgtcgaagg cggaaaggccga atatggcgca 600
 aatcaagtgcc tggatctgcgc gAACGGCGAC gtgcaggaaaa ccggcgcgtc caactttatc 660
 ctgatggatcg gcgatgaaat cattacccaa cccgtgaccg acgagtttt gcacggcgta 720
 acccgcgatt ccgtactgac gggtgcacaa gattgggct ataccgtcag cgaacgcata 780
 ttcacgggtt acgaactcaa agctgcgggt gaaaacgggt cggaaaggcat tttgaccgg 840
 acggcagccg tcatctcgcc cggtacttcc ttgcgtcatcg gccgcaaaaga aatcgaagtg 900
 aaaagccaaag aacgcggcta tgccatccgt aaggcgatta ccgacatcca gtatggttt 960

gcgaaagaca aatacggctg gctggttgaa gtgtgctga 999

<210> 48
<211> 332

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0337 protein sequence

<400> 48

Met Ser Arg Pro Val Pro Ala Val Phe Gly Ser Val Phe His Ser Gln
1 5 10 15

Met Pro Val Leu Ala Tyr Arg Glu Gly Lys Trp Gln Pro Thr Glu Trp
20 25 30

Gln Ser Ser Gln Asp Leu Ser Leu Ala Pro Gly Ala His Ala Leu His
35 40 45

Tyr Gly Ser Glu Cys Phe Glu Gly Leu Lys Ala Phe Arg Gln Ala Asp
50 55 60

Gly Lys Ile Val Leu Phe Arg Pro Thr Ala Asn Ile Ala Arg Met Arg
65 70 75 80

Gln Ser Ala Asp Ile Leu His Leu Pro Arg Pro Glu Thr Glu Ala Tyr
85 90 95

Leu Asp Ala Leu Ile Lys Leu Val Lys Arg Ala Ala Asp Glu Ile Pro
100 105 110

Asp Ala Pro Ala Ala Leu Tyr Leu Arg Pro Thr Leu Ile Gly Thr Asp
115 120 125

Pro Val Ile Gly Lys Ala Gly Ser Pro Ser Glu Thr Ala Leu Leu Tyr
130 135 140

Ile Leu Ala Ser Pro Val Gly Asp Tyr Phe Lys Val Gly Ser Pro Val
145 150 155 160

Lys Ile Leu Val Glu Thr Glu His Ile Arg Cys Ala Pro His Met Gly
165 170 175

Arg Val Lys Cys Gly Gly Asn Tyr Ala Ser Ala Met His Trp Val Leu
180 185 190

Lys Ala Lys Ala Glu Tyr Gly Ala Asn Gln Val Leu Phe Cys Pro Asn
195 200 205

Gly Asp Val Gln Glu Thr Gly Ala Ser Asn Phe Ile Leu Ile Asn Gly
210 215 220

Asp Glu Ile Ile Thr Lys Pro Leu Thr Asp Glu Phe Leu His Gly Val
225 230 235 240

Thr Arg Asp Ser Val Leu Thr Val Ala Lys Asp Leu Gly Tyr Thr Val
245 250 255

Ser Glu Arg Asn Phe Thr Val Asp Glu Leu Lys Ala Ala Val Glu Asn
260 265 270

Gly Ala Glu Ala Ile Leu Thr Gly Thr Ala Ala Val Ile Ser Pro Val
275 280 285

Thr Ser Phe Val Ile Gly Gly Lys Glu Ile Glu Val Lys Ser Gln Glu
290 295 300

Arg Gly Tyr Ala Ile Arg Lys Ala Ile Thr Asp Ile Gln Tyr Gly Leu
305 310 315 320

Ala Glu Asp Lys Tyr Gly Trp Leu Val Glu Val Cys
325 330

<210> 49
<211> 774

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0191 DNA sequence

<400> 49
atgagtgcga acatccattgc catcgccaaat cagaaggcg gtgtgggcaa aacgacgacg 60
acggtaaatt tggcggcttc gctggcatcg cgccggcaaaac gcgtgtgggt gtcgatttg 120
gatccgcagg gcaatgcgcac gacgggcagc ggcatcgaca aggcgggttt gcagtccggc 180
gtttatcagg tcttattggg cgatgcgcac gtgcagtcgg cggcggtacg cagcaaagag 240
ggcggatacg ctgtgttggg tgcaaacgc ggcgtggccg ggcggaaat cgaactggtg 300
cagggaaatcg cccgggaagt gcgtttgaaa aacgcgctca aggcagtggaa agaagattac 360
gactttatcc tgatcgactg cccgccttcg ctgacgctgt tgacgcttaa cgggctggtg 420
gcggcgggcg gcgtgattgt gcccgttgg tgcaaatatt acgcgctggaa agggatttcc 480
gatttattgc cgaccgtgcg caaaatcgt cagggcgtca atcccgattt ggacatcacg 540
ggcatcgtc gcacgatgta cgacagccgc agcaggctgg ttgccgaagt cagcgaacag 600
ttgcgcagcc atttcgggaa ttgcgtttt gaaaccgtca tcccgcgcaa tatccgcctt 660
gcggaagcgc cgagccacgg tatgccgtg atggcttacg acgcgcaggc aaagggtacc 720
aaggcgtatc ttgccttggc ggacgagctg gcggcgaggg tgtcgggaa atag 774

<210> 50
<211> 257

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0191 protein sequence

<400> 50
Met Ser Ala Asn Ile Leu Ala Ile Ala Asn Gln Lys Gly Gly Val Gly
1 5 10 15

Lys Thr Thr Thr Val Asn Leu Ala Ala Ser Leu Ala Ser Arg Gly
20 25 30

Lys Arg Val Leu Val Val Asp Leu Asp Pro Gln Gly Asn Ala Thr Thr
35 40 45

Gly Ser Gly Ile Asp Lys Ala Gly Leu Gln Ser Gly Val Tyr Gln Val
50 55 60

Leu Leu Gly Asp Ala Asp Val Gln Ser Ala Ala Val Arg Ser Lys Glu
65 70 75 80

Gly Gly Tyr Ala Val Leu Gly Ala Asn Arg Ala Leu Ala Gly Ala Glu
85 90 95

Ile Glu Leu Val Gln Glu Ile Ala Arg Glu Val Arg Leu Lys Asn Ala
100 105 110

Leu Lys Ala Val Glu Glu Asp Tyr Asp Phe Ile Leu Ile Asp Cys Pro
115 120 125

Pro Ser Leu Thr Leu Leu Thr Leu Asn Gly Leu Val Ala Ala Gly Gly

130	135	140
Val Ile Val Pro Met Leu Cys Glu Tyr Tyr Ala Leu Glu Gly Ile Ser		
145	150	155
Asp Leu Ile Ala Thr Val Arg Lys Ile Arg Gln Ala Val Asn Pro Asp		
165	170	175
Leu Asp Ile Thr Gly Ile Val Arg Thr Met Tyr Asp Ser Arg Ser Arg		
180	185	190
Leu Val Ala Glu Val Ser Glu Gln Leu Arg Ser His Phe Gly Asp Leu		
195	200	205
Leu Phe Glu Thr Val Ile Pro Arg Asn Ile Arg Leu Ala Glu Ala Pro		
210	215	220
Ser His Gly Met Pro Val Met Ala Tyr Asp Ala Gln Ala Lys Gly Thr		
225	230	235
Lys Ala Tyr Leu Ala Leu Ala Asp Glu Leu Ala Ala Arg Val Ser Gly		
245	250	255

Lys

<210> 51
<211> 1335
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1710 DNA sequence

<400> 51
atgactgacc tgaacaccct gtttgccaaac ctc当地acaac gcaatccaa tcaggagccg 60
ttccatcagg cggttgaaga agtcttcatg agtctcgatc cgttttggc aaaaaatccg 120
aaatacaccc agcaaaggct gctggAACgc atcgtcgaac cc当地acgcgt cgtatgttc 180
cgcgttaacct ggcaggacga taaaggccaa gtccaaagtca accggggcta cc当地gtgcaa 240
atgagttccg cc当地cggtcc ttacaaaaggc ggctctgcgtc tccatccgac cgtcgatttg 300
ggcgttattga aatttcctcgc ttttgaacaa gtgttcaaaa acgccttgac caccctgcct 360
atggggccggc gcaaaggccg ttccgacttc gaccccaaag gcaaatccg tgccgaagta 420
atgcgttctt gccaaggcctt tatgaccgaa ct当地accgac acatccggcgc ggacaccgat 480
gttccggccg ggc当地atcg cgtagggccgg cgccgaaatcg gctacctgtt cggacaatac 540
aaaaaaaaatcc gcaacgagtt ttcttcgtc ctgaccggca aagggttggc atggggccgc 600
agcctcatcc gtccccaagc gaccggctac ggctgcgtct atttcgcctt agcgatgctg 660
caaaccggca acgatagttt tgaaggccaa cgc当地ctgtca tttccggctc cggcaatgtg 720
gcfcaatacg cc当地cgaaaa agccatccaa ctgggtgcga aagtactgac ct当地ccgac 780
tccaaacggct tc当地cttcccgcacagc ggtatgaccg aagc当地act cc当地ccctt 840
atcgaattga aagaagtccg cc当地gaacgc gttgccacct acgccaaaaga gcaaggctg 900
caataacttg aaaaacaaaa accgtggggc gtc当地ccggc aaatccctt gccctgcgcg 960
accaggaaacg aattggacga agaaggccgc aaaaccctgt tggcaacgg ct当地tacgtc 1020
gttgc当地gg gtc当地aatat gccgtcact ttggggccgg tc当地gaaatt tatcaaaggc 1080
ggc当地cttct acgccccggg aaaaggctcc aatgcccggc gctgc当地aac tt当地aggttg 1140
gaaatgagcc aaaacgccc cat cc当地ctgtct tggactcgtg aagaagtccg ccaacgcctg 1200
ttccggcatca tgcaaaggcat ccacgaatcc tgc当地gaaat acggccaaatg cggccacaca 1260
gtaaactacg tcaatggtgc gaacattgcc ggttccgtca aagttgccg tgccatgtctg 1320
gcfcaaggct tctaa 1335

<210> 52
<211> 444
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1710 protein sequence

<400> 52
 Met Thr Asp Leu Asn Thr Leu Phe Ala Asn Leu Lys Gln Arg Asn Pro
 1 5 10 15
 Asn Gln Glu Pro Phe His Gln Ala Val Glu Glu Val Phe Met Ser Leu
 20 25 30
 Asp Pro Phe Leu Ala Lys Asn Pro Lys Tyr Thr Gln Gln Ser Leu Leu
 35 40 45
 Glu Arg Ile Val Glu Pro Glu Arg Val Val Met Phe Arg Val Thr Trp
 50 55 60
 Gln Asp Asp Lys Gly Gln Val Gln Val Asn Arg Gly Tyr Arg Val Gln
 65 70 75 80
 Met Ser Ser Ala Ile Gly Pro Tyr Lys Gly Gly Leu Arg Phe His Pro
 85 90 95
 Thr Val Asp Leu Gly Val Leu Lys Phe Leu Ala Phe Glu Gln Val Phe
 100 105 110
 Lys Asn Ala Leu Thr Thr Leu Pro Met Gly Gly Lys Gly Gly Ser
 115 120 125
 Asp Phe Asp Pro Lys Gly Lys Ser Asp Ala Glu Val Met Arg Phe Cys
 130 135 140
 Gln Ala Phe Met Thr Glu Leu Tyr Arg His Ile Gly Ala Asp Thr Asp
 145 150 155 160
 Val Pro Ala Gly Asp Ile Gly Val Gly Arg Glu Ile Gly Tyr Leu
 165 170 175
 Phe Gly Gln Tyr Lys Lys Ile Arg Asn Glu Phe Ser Ser Val Leu Thr
 180 185 190
 Gly Lys Gly-Leu-Glu Trp Gly Gly Ser Leu Ile Arg Pro Glu-Ala-Thr
 195 200 205
 Gly Tyr Gly Cys Val Tyr Phe Ala Gln Ala Met Leu Gln Thr Arg Asn
 210 215 220
 Asp Ser Phe Glu Gly Lys Arg Val Leu Ile Ser Gly Ser Gly Asn Val
 225 230 235 240
 Ala Gln Tyr Ala Ala Glu Lys Ala Ile Gln Leu Gly Ala Lys Val Leu
 245 250 255
 Thr Val Ser Asp Ser Asn Gly Phe Val Leu Phe Pro Asp Ser Gly Met
 260 265 270
 Thr Glu Ala Gln Leu Ala Ala Leu Ile Glu Leu Lys Glu Val Arg Arg
 275 280 285
 Glu Arg Val Ala Thr Tyr Ala Lys Glu Gln Gly Leu Gln Tyr Phe Glu
 290 295 300
 Lys Gln Lys Pro Trp Gly Val Ala Ala Glu Ile Ala Leu Pro Cys Ala
 305 310 315 320

Thr Gln Asn Glu Leu Asp Glu Glu Ala Ala Lys Thr Leu Leu Ala Asn
 325 330 335
 Gly Cys Tyr Val Val Ala Glu Gly Ala Asn Met Pro Ser Thr Leu Gly
 340 345 350
 Ala Val Glu Gln Phe Ile Lys Ala Gly Ile Leu Tyr Ala Pro Gly Lys
 355 360 365
 Ala Ser Asn Ala Gly Gly Val Ala Thr Ser Gly Leu Glu Met Ser Gln
 370 375 380
 Asn Ala Ile Arg Leu Ser Trp Thr Arg Glu Glu Val Asp Gln Arg Leu
 385 390 395 400
 Phe Gly Ile Met Gln Ser Ile His Glu Ser Cys Leu Lys Tyr Gly Lys
 405 410 415
 Val Gly Asp Thr Val Asn Tyr Val Asn Gly Ala Asn Ile Ala Gly Phe
 420 425 430
 Val Lys Val Ala Asp Ala Met Leu Ala Gln Gly Phe
 435 440
 <210> 53
 <211> 867
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0062 DNA sequence
 <400> 53
 Ala Thr Gly Ala Ala Ala Gly Gly Cys Ala Thr Cys Ala Thr Ala Cys
 1 5 10 15
 Thr Gly Gly Cys Ala Gly Gly Cys Gly Gly Cys Ala Gly Cys Gly Gly
 20 25 30
 Cys Ala Cys Gly Cys Gly Cys Cys Thr Cys Thr Ala Cys Cys Cys Cys
 35 40 45
 Ala Thr Cys Ala Cys Gly Cys Gly Cys Gly Thr Ala Thr
 50 55 60
 Cys Cys Ala Ala Ala Cys Ala Gly Cys Thr Cys Cys Thr Gly Cys Cys
 65 70 75 80
 Cys Gly Thr Gly Thr Ala Cys Gly Ala Cys Ala Ala Cys Cys Gly
 85 90 95
 Ala Thr Gly Ala Thr Thr Ala Thr Thr Ala Cys Cys Cys Cys Thr
 100 105 110
 Thr Gly Thr Cys Gly Gly Thr Thr Thr Gly Ala Thr Gly Cys Thr
 115 120 125
 Gly Gly Cys Gly Gly Ala Ala Thr Cys Cys Gly Cys Gly Ala Thr
 130 135 140
 Ala Thr Thr Thr Thr Gly Thr Gly Ala Thr Thr Ala Cys Cys Gly
 145 150 155 160
 Cys Gly Cys Cys Thr Gly Ala Ala Gly Ala Cys Ala Ala Cys Gly Cys

165	170	175	
Cys Thr Cys Thr Thr Cys Ala Ala Ala Cys Gly Cys Cys Thr Gly			
180	185	190	
Cys Thr Thr Gly Gly Cys Gly Ala Cys Gly Cys Ala Gly Cys Gly			
195	200	205	
Ala Thr Thr Thr Cys Gly Gly Cys Ala Thr Thr Thr Cys Cys Ala Thr			
210	215	220	
Cys Ala Gly Thr Thr Ala Thr Gly Cys Cys Gly Thr Gly Cys Ala Ala			
225	230	240	
Cys Cys Cys Ala Gly Thr Cys Cys Gly Gly Ala Cys Gly Gly Cys Thr			
245	250	255	
Thr Gly Gly Cys Ala Cys Ala Gly Gly Cys Ala Thr Thr Ala Thr			
260	265	270	
Cys Ala Thr Cys Gly Gly Cys Gly Ala Ala Gly Ala Ala Thr Thr Thr			
275	280	285	
Ala Thr Cys Gly Gly Cys Ala Ala Cys Gly Ala Cys Ala Ala Thr Gly			
290	295	300	
Thr Thr Thr Gly Cys Thr Thr Gly Gly Thr Thr Thr Gly Gly Gly			
305	310	315	320
Cys Gly Ala Cys Ala Ala Thr Ala Thr Thr Thr Thr Ala Cys			
325	330	335	
Gly Gly Thr Cys Ala Gly Thr Cys Gly Thr Thr Thr Ala Cys Gly Cys			
340	345	350	
Ala Ala Ala Cys Ala Thr Thr Gly Ala Ala Ala Cys Ala Gly Gly Cys			
355	360	365	
Gly Gly Cys Ala Gly Cys Gly Cys Ala Ala Ala Cys Gly Cys Ala Cys			
370	375	380	
Gly Gly Cys Gly Cys Ala Ala Cys Cys Gly Thr Gly Thr Thr Thr Gly			
385	390	395	400
Cys Thr Thr Ala Thr Cys Ala Gly Gly Thr Cys Ala Ala Ala Ala			
405	410	415	
Cys Cys Cys Cys Gly Ala Ala Cys Gly Thr Thr Thr Cys Gly Gly Cys			
420	425	430	
Gly Thr Gly Gly Thr Thr Gly Ala Ala Thr Thr Ala Ala Cys Gly			
435	440	445	
Ala Ala Ala Ala Cys Thr Thr Cys Cys Gly Cys Cys Cys Gly Thr			
450	455	460	
Thr Thr Cys Cys Ala Thr Cys Gly Ala Ala Gly Ala Ala Ala Ala			
465	470	475	480
Cys Cys Gly Cys Ala Ala Cys Gly Gly Cys Cys Cys Ala Ala Ala Thr			
485	490	495	

Cys Cys Gly Ala Thr Thr Gly Gly Gly Cys Gly Gly Thr Ala Ala Cys
500 505 510

Cys Gly Gly Cys Thr Thr Gly Thr Ala Thr Thr Thr Cys Thr Ala Cys
515 520 525

Gly Ala Cys Ala Ala Cys Cys Gly Cys Gly Cys Cys Gly Thr Cys Gly
530 535 540

Ala Gly Thr Thr Cys Gly Cys Cys Ala Ala Ala Cys Ala Gly Cys Thr
545 550 555 560

Cys Ala Ala Ala Cys Cys Gly Thr Cys Cys Gly Cys Ala Cys Gly Cys
565 570 575

Gly Gly Cys Gly Ala Ala Thr Thr Gly Gly Ala Ala Ala Thr Thr Ala
580 585 590

Cys Cys Gly Ala Cys Cys Thr Cys Ala Ala Cys Cys Gly Gly Ala Thr
595 600 605

Gly Thr Ala Thr Thr Thr Gly Gly Ala Ala Gly Ala Cys Gly Gly Cys
610 615 620

Thr Cys Gly Cys Thr Cys Cys Gly Thr Thr Cys Ala Ala Ala
625 630 635 640

Thr Ala Thr Thr Gly Gly Ala Cys Gly Cys Gly Gly Thr Thr Thr
645 650 655

Cys Gly Cys Gly Thr Gly Gly Cys Thr Gly Gly Ala Cys Ala Cys Cys
660 665 670

Gly Gly Cys Ala Cys Cys Cys Ala Cys Gly Ala Gly Ala Gly Cys Cys
675 680 685

Thr Gly Cys Ala Cys Gly Ala-Ala-Gly Cys Cys Gly Cys Thr Thr Cys
690 695 700

Ala Thr Thr Cys Gly Thr Cys Cys Ala Ala Ala Cys Cys Gly Thr Gly
705 710 715 720

Cys Ala Ala Ala Ala Thr Ala Thr Cys Cys Ala Ala Ala Cys Cys
725 730 735

Thr Gly Cys Ala Cys Ala Thr Cys Gly Cys Cys Thr Gly Cys Cys Thr
740 745 750

Cys Gly Ala Ala Gly Ala Ala Ala Thr Cys Gly Cys Thr Thr Gly Gly
755 760 765

Cys Gly Cys Ala Ala Cys Gly Gly Thr Thr Gly Gly Cys Thr Thr Thr
770 775 780

Cys Cys Gly Ala Thr Gly Ala Ala Ala Ala Cys Thr Gly Gly Ala
785 790 795 800

Ala Gly Ala Ala Thr Thr Gly Gly Cys Gly Cys Gly Cys Cys Gly
805 810 815

Ala Thr Gly Gly Cys Gly Ala Ala Ala Ala Cys Cys Ala Ala Thr
 820 825 830

Ala Cys Gly Gly Cys Cys Ala Ala Thr Ala Thr Thr Gly Cys Thr
 835 840 845

Gly Cys Gly Cys Cys Thr Gly Thr Thr Gly Ala Ala Ala Ala Ala
 850 855 860

Thr Ala Ala
 865

<210> 54
 <211> 288
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0062 protein sequence

<400> 54
 Met Lys Gly Ile Ile Leu Ala Gly Gly Ser Gly Thr Arg Leu Tyr Pro
 1 5 10 15

Ile Thr Arg Gly Val Ser Lys Gln Leu Leu Pro Val Tyr Asp Lys Pro
 20 25 30

Met Ile Tyr Tyr Pro Leu Ser Val Leu Met Leu Ala Gly Ile Arg Asp
 35 40 45

Ile Leu Val Ile Thr Ala Pro Glu Asp Asn Ala Ser Phe Lys Arg Leu
 50 55 60

Leu Gly Asp Gly Ser Asp Phe Gly Ile Ser Ile Ser Tyr Ala Val Gln
 65 70 75 80

Pro Ser Pro Asp Gly Leu Ala Gln Ala Phe Ile Ile Gly Glu Glu Phe
 85 90 95

Ile Gly Asn Asp Asn Val Cys Leu Val Leu Gly Asp Asn Ile Phe Tyr
 100 105 110

Gly Gln Ser Phe Thr Gln Thr Leu Lys Gln Ala Ala Ala Gln Thr His
 115 120 125

Gly Ala Thr Val Phe Ala Tyr Gln Val Lys Asn Pro Glu Arg Phe Gly
 130 135 140

Val Val Glu Phe Asn Glu Asn Phe Arg Ala Val Ser Ile Glu Glu Lys
 145 150 155 160

Pro Gln Arg Pro Lys Ser Asp Trp Ala Val Thr Gly Leu Tyr Phe Tyr
 165 170 175

Asp Asn Arg Ala Val Glu Phe Ala Lys Gln Leu Lys Pro Ser Ala Arg
 180 185 190

Gly Glu Leu Glu Ile Thr Asp Leu Asn Arg Met Tyr Leu Glu Asp Gly
 195 200 205

Ser Leu Ser Val Gln Ile Leu Gly Arg Gly Phe Ala Trp Leu Asp Thr
 210 215 220

Gly Thr His Glu Ser Leu His Glu Ala Ala Ser Phe Val Gln Thr Val

225	230	235	240
Gln Asn Ile Gln Asn Leu His Ile Ala Cys Leu Glu Glu Ile Ala Trp			
245	250	255	
Arg Asn Gly Trp Leu Ser Asp Glu Lys Leu Glu Glu Leu Ala Arg Pro			
260	265	270	
Met Ala Lys Asn Gln Tyr Gly Gln Tyr Leu Leu Arg Leu Leu Lys Lys			
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<210> 55
<211> 918
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1583 DNA sequence

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ctgatggcaa	aactcgaaaa	acacaccggc	aaacccaaag	gctggctcg	cagaaaacac	240
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gccgaaaccg	catctgctgc	cggctgcccgc	agcgttaccg	tcaaccgcaa	tacctgcgaa	360
acccaaatca	ccgctctccat	caacctcgac	ggcagcggca	aaagcaggct	ggataccggc	420
gtacccttcc	tcgaacacat	gatcgatcaa	atcgcccgc	acggcatgat	tgacatcgac	480
atcagctgca	aaggcgacct	gcacatcgac	gaccaccaca	ccgcccaga	catcggcac	540
acactcgac	aagcaatccg	gcaggcactc	ggcgacaaaa	aaggcatccg	ccgttacgga	600
cattcctacg	tcccgtcga	cgaaggccctc	agccgcgtcg	tcatcgac	ttccggccgc	660
cccggaactcg	tgtacaacat	cgaatttacc	cgccgactaa	tcggacgttt	cgatgtcgat	720
ttgtttgaag	aattttcca	cggcatcg	aaccacagta	tcatcgac	gcacatcgac	780
aacctcagcg	gcaaaaacgc	ccaccatcag	gcccggaaaccg	tattcaaagc	cttcggggcgc	840
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<400> 56

Met Asn Leu Thr Lys Thr Gln Arg Gln Leu His Asn Phe Leu Thr Leu			
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Arg Thr Pro Val Ala Leu Tyr Lys Leu Lys Gln Arg Leu Glu Lys Gln		
35	40	45

Ala Glu Asp Pro Asp Ala Arg Gly Ile Arg Pro Ser Leu Met Ala Lys		
50	55	60

Leu Glu Lys His Thr Gly Lys Pro Lys Gly Trp Leu Asp Arg Lys His			
65	70	75	80

Arg Glu Arg Thr Val Pro Glu Thr Ala Ala Glu Ser Thr Gly Thr Ala		
85	90	95

Glu Thr Gln Ile Ala Glu Thr Ala Ser Ala Ala Gly Cys Arg Ser Val		
100	105	110

Thr Val Asn Arg Asn Thr Cys Glu Thr Gln Ile Thr Val Ser Ile Asn
115 120 125

Leu Asp Gly Ser Gly Lys Ser Arg Leu Asp Thr Gly Val Pro Phe Leu
130 135 140

Glu His Met Ile Asp Gln Ile Ala Arg His Gly Met Ile Asp Ile Asp
145 150 155 160

Ile Ser Cys Lys Gly Asp Leu His Ile Asp Asp His His Thr Ala Glu
165 170 175

Asp Ile Gly Ile Thr Leu Gly Gln Ala Ile Arg Gln Ala Leu Gly Asp
180 185 190

Lys Lys Gly Ile Arg Arg Tyr Gly His Ser Tyr Val Pro Leu Asp Glu
195 200 205

Ala Leu Ser Arg Val Val Ile Asp Leu Ser Gly Arg Pro Gly Leu Val
210 215 220

Tyr Asn Ile Glu Phe Thr Arg Ala Leu Ile Gly Arg Phe Asp Val Asp
225 230 235 240

Leu Phe Glu Glu Phe Phe His Gly Ile Val Asn His Ser Met Met Thr
245 250 255

Leu His Ile Asp Asn Leu Ser Gly Lys Asn Ala His His Gln Ala Glu
260 265 270

Thr Val Phe Lys Ala Phe Gly Arg Ala Leu Arg Met Ala Val Glu His
275 280 285

Asp Pro Arg Met Ala Gly Gln Thr Pro Ser Thr Lys Gly Thr Leu Thr
290 295 300

Ala
305

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